BRITISH MEDICAL JOURNAL

LONDON SATURDAY MAY 20 1939

DISORDERS OF THE SMALL INTESTINE*

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(WITH SPECIAL PLATE)

The small intestine is the essential part of the alimentary tube. Health can be maintained or life can be endured without the stomach or the colon, and without the function of the gullet; but a good piece of the small bowel must remain. In structure it is primitive yet complex, made up nearly all of active cells, secreting, absorbing, or moving, with a rich blood and nerve supply and a minimum of binding fibres. It curls, twists, pales, and flushes as it mixes, digests, and chooses the foodstuffs and passes on what is left. It is responsive to the rest of the body through messages carried in nerves and blood, but can be as independent as any organ, keeping in life and on duty when almost all else has failed.

The vital importance of the small bowel, with its expanse of absorbing cells, is shown by the marasmus which follows if too much of it is removed, by the intense toxaemia set up by acute enteritis, cholera, or enteric fever, and by the disaster of obstruction. The effects of faulty absorption may be seen in coeliac disease and in infantilism from tuberculous strictures and some cases of chronic ileitis. It is not surprising that if it is interfered with in any other way persistent and distressing symptoms should arise. Except for such conditions, and general infections like tuberculosis, the small intestine has a remarkable immunity as compared with other parts of the alimentary tube. Regional ileitis and carcinoid tumours, both uncommon, seem to be the only diseases peculiar to it.

In this brief review it is not proposed to discuss any disease fully. A more detailed illustrated survey was published in 1937. A few words should be said about "flatulence," "wind," and "distension," for these are the commonest symptoms complained of in intestinal disorders, except perhaps constipation; and distension causes more distress in the small than in the large intestine.

[The lecturer then described the composition and pressure of intestinal gases (Boycott and Dannant, 1907–8; Lloyd-Jones and Liljedahl, 1934; Wangensteen, 1937), and the circulation in the gut (Spriggs, 1931); and continued:] For these reasons wind is a feature of any delay of bowel movement resulting in irregular spasms and inhibitions, as in disorders of the stomach or gut, including disturbance from unwise food or drink, and constipation; and most of all of inhibition of the bowel after operations or with obstruction. Wind is also a feature of poor circulation in the bowel from heart disease, portal cirrhosis, arterial disease, as angina, and the arteriosclerosis of elderly people. If a patient complains of wind, and there is not an excess of gas in the stomach or bowel, the sensation is generally due to an attempt of the alimentary tube to move away some lesion or irritation, either in itself or, more rarely, reflex from another organ, such as the gall-bladder or kidney. In each case, whether eructation relieves for a time or not, the gas is not the cause. Further search for a diagnosis must therefore be made and treatment directed accordingly.

Most disorders of the small bowel, as met with in practice, apart from gastro-enteritis and obstruction, are either at the upper end from ulcer and its operative treatment, or at the lower end from the results of inflammation or operation in the appendical area. The rarer affections of the main part of the jejunum and ileum are, in order of frequency, diverticulosis, duodenal ileus, tuberculosis, regional ileitis, secondary growths, intussusception, primary growths, actinomycosis, and foreign bodies. I propose to consider the groups in that order.

Duodenal Ulcer

The commonest disease of the small intestine is duodenitis and duodenal ulcer. It occurs mainly in the male; thus in 360 cases admitted to the Ruthin Castle Clinic there were about nine men to one woman. This complaint is one of the forms of peptic ulcer; it belongs to the stomach as much as to the intestine, and will not now be described. It may perhaps be remarked that over thirty years ago I published what I believe was the first series of cases of peptic ulcer which were treated in this country, in St. George's Hospital, by feeding from the beginning (Spriggs, 1907a, 1907b, 1909, 1910). The graduated diet was modified from the more robust one used by Lenhartz; and I have prescribed it, with the addition of the olive oil suggested by Walko (1902) and Cohnheim (1904) and other modifications, ever since (Anderson, 1929). Cases with haemorrhage were also fed successfully, with frequent small quantities, a teaspoonful or so at a time. W. Langdon-Brown (1908–9) published another series soon afterwards. The Danish physician, E. Meulengracht (1933), has confirmed this principle, especially in cases with haemorrhage, beginning with

* An abstract of a British Medical Association Lecture delivered at Sheffield on February 10, 1939.

rather fuller meals of soft food, and has set forth anew the arguments for feeding as against what he calls the inanition treatment.

Disorders of the Jejunum after Gastro-enterostomy

The surgical treatment of duodenal ulcers which have proved resistant to medical measures has restored health to a great number of people. It has also brought to the physician sufferers from disorders of the small intestine following upon gastro-enterostomy; though now that that operation is being done with more discrimination I am not seeing so many of such cases. In 166 consecutive patients admitted with a gastro-enterostomy, reviewed by R. P. Picton Davies, 151 sought relief from symptoms ascribed to the operation. Out of forty-nine others in whom that operation was advised by us for gastric or duodenal disease, four returned with symptoms, making a series of 155 cases seeking relief after gastro-enterostomy. That group of forty-nine gives 8 per cent. of failures. In Luff's analysis of 2,609 operations by eighty-six surgeons (Short, 1932) the failures were given as 5 per cent. But I find modern surgeons put it higher—from 10 per cent. upwards. Seventeen years ago Mr. Marxer and I published a review of fifty-one of these unfortunates, and later experience has confirmed most of what was then concluded (Spriggs and Marxer, 1922). A detailed diagnosis is called for by means of a careful history, conning of symptoms, observation, and experience. Delicate radiology is essential, and may be aided by the gastroscope.

[The various complications which may follow gastro-enterostomy were then described, with illustrations.]

On examination of the faeces after gastro-enterostomy there is often a moderate deficiency in the absorption of fat; in ten cases the loss was found by A. J. Leigh to be not above 15 per cent. (Spriggs and Marxer, 1922). Other foods, even in diarrhoea, are well absorbed as a rule. Wasting, when present, is due, therefore, to less food being taken on account of discomfort, and not, as the patient is apt to assume, to lack of its digestion. The not infrequent appearance of a little sugar in the urine is ascribed to over-rapid absorption, due to the food passing in bulk straight into the intestine. I still see an occasional patient with a gastro-enterostomy in whom diabetes has been wrongly suspected.

This series of 155 may be regarded as severe cases; most had suffered long and had tried many methods before admission. Medical treatment, founded on the condition present, relieved two-thirds of the patients. I have described in more detail measures which may be used (Spriggs and Marxer, 1922). The diet needs to be worked out for each person; it is often mainly solid, but sometimes liquid. Fat is usually not well borne. Constipation is not uncommon, and its correction is a simple measure which may give remarkable relief.

Further surgery is advised if thorough medical treatment fails and the patient is unable to live a normal life; and especially if there is evidence of resistant ulceration, bile regularly in the stomach, irritation from food lying between stoma and pylorus, or if the loops are twisted or adherent, with delay. In a few cases in which the duodenum was healthy the parts were restored to their natural state. A second operation was done in one-third of the cases—namely, forty-nine of the 155. Eleven patients had three operations, three of them four. One has had five, and has borne them well. Of eleven deaths occurring in the whole series within about two years of review five were after operations, two from perforation, two from haemorrhage, one from carcinoma at the stoma, and one from anaemia, achlorhydric but not macrocytic, nine years after gastro-enterostomy.

Jejunal ulcers are reported to be rarer after partial gastrectomy than after gastro-enterostomy, whereas anaemia is commoner. From Luff's analysis (Short, 1932) of 2,130 gastrectomies it was concluded that ulcer developed in 0.6 per cent. Here again the estimate is higher in personal conversation with surgeons of experience. My own series is a small one—fifteen cases—and the impression given has been favourable. One case, however, perforated five months later, at a time when the patient was faced with serious business anxiety; he recovered after operation, and is under treatment.

So much is unknown about the first causes of peptic ulcers, and their relation to local inflammation, gastric chemistry, and to nerve and blood supply, that it cannot be supposed that we have approached finality about their prevention and treatment.

Intestinal Disorders arising from Mechanical Interference

There is a general similarity between disorders of the small intestine after gastro-enterostomy and those which arise from mechanical interference with the jejunum or ileum in other parts of the abdomen. These cases form a large if amorphous group, not mentioned in systematic works, but calling for more time and thought than many diseases that are fully described. The interference was often, though not always, towards the end of the ileum and due to post-operative adhesions, as after appendicectomy, ovariotomy, or an anastomosis. Other causes were appendicitis without operation, glands, tumours, volvuli, herniae, and peritonitis.

The intestine is tolerant of adhesions. It is tolerant also of interference with its lumen by gradual pressure. But if either nutrition or muscular contraction is hindered symptoms will arise which are troublesome, though often long unrecognized as arising from the small bowel. I have records of forty such cases, of which twenty-two had been operated upon. These puzzling patients complain of flatulence, pain, or discomfort, about the navel and to the right, or sometimes to the root of the mesentery on the left, gurgling, nausea, poor appetite, diarrhoea, or constipation. The discomfort may have a food relation. Thus in seven it was referred, after food, to the right iliac fossa. The signs are distension and tenderness in the area affected and poor nutrition. An incessant chronic discomfort in the abdomen is accompanied by nervous phenomena, and some of these folk are labelled neurasthenic, whereas they are the subjects of a mild chronic partial obstruction of the small gut.

DIAGNOSIS

The main matter is to exclude common disorders of other organs, such as the stomach, colon, and appendix. The last has often been removed. The physician has also to satisfy himself as to the value to be put upon the complaint of pain. If the complaint is consistent and persistent, and if after watching the patient I believe in the pain, cause for it sooner or later is almost always found. Especially difficult are cases in which there are intervals of freedom from symptoms. One introspective young man gave a history of acute discomfort and left-sided distension to which were added phobias about food and other matters, tending to confine the attention of the physician to the psychological or even psychotic field. No one but he himself had observed the distension. The symptoms and signs were said to come on later in the

day. A special examination was therefore made at the time of complaint, whereupon a loop of small bowel was demonstrated lying beneath a temporary volvulus of the sigmoid. Operation led to complete relief from the discomfort.

Radiology.—The recognition of the cause in many other cases has been made possible since the radiology of the small intestine has been developed. Not so long ago very little was seen of the bowel between the duodenum and the caecum. O. A. Marxer uses for the jejunum and ileum a dextrin suspension of barium. The patient is kept in a room adjacent to the *x*-ray room, and observations are made at frequent intervals—for example, from fifteen minutes to an hour, or oftener if special features are to be observed. Fig. 2 (see Plate) shows a normal jejunum and ileum.

TREATMENT

The treatment varies for each case. The lines to be followed become clear when it has been established that the symptoms are not due to colitis or nerves but arise from the jejunum or ileum. In about half the patients the interference with the small gut was moderate and non-progressive. In those cases relief was obtained by medical measures—poultices, massage, faradism, exercise, and a belt or binder when the intestine seemed to be suspended. A diet without fruit or greens is given at first with vitamins, and then those foods are cautiously added. Liquid food favours distension. Paraffin, belladonna, sulphocarbolate of soda, kaolin, and dilute hydrochloric acid, and on occasion pituitrin, are prominent among helpful medicines, with a regulated life, and moderation in alcohol and tobacco. Even in severer cases, with great dilatation of the gut, as above an anastomosis, such treatment may relieve far more than would at first be expected. Fig. 3 illustrates such a case, of which the history was as follows:

Case 1.—A woman aged 56. At 40 she had appendicostomy for constipation and distension, and at 42 colectomy, which gave relief. Multiple arthritis in last two years. On admission complained of heartburn, "feeling poisoned," abdominal pain, worse after food, and distension, relieved by passing flatus; daily loose stools with paraffin and a suppository; rheumatic pains and stiffness; cough. Weight, 5 st. 13 lb. Diagnosis: gastric superacidity, great dilatation of terminal ileum above the anastomosis; rheumatoid arthritis. Treatment: three simple meals a day, with sieved greens but no fruit; olive oil before meals, paraffin, belladonna; gentle abdominal massage, poultice for pain, and a mixture containing 15 grains each of sulphocarbolate and citrate of soda. After six weeks no heartburn or "poisoned feeling," more energy, abdomen less distended, softer, and more comfortable. Pain rare, and relieved by a poultice and belladonna. To continue the regime at home.

In others operation is advised. Diet and other medicines are in vain if the proper movements of the ileum are prevented. I do not ask the surgeon to reopen the abdomen for post-operative adhesions unless there is evidence of such interference with function, preferably at an ascertained spot. In this series of forty, eight were operated upon with relief.

INCIDENCE OF AFFECTIONS OF THE SMALL INTESTINE

In the above two groups the disorder of the small intestine has been imposed upon it from without, mostly at the upper or the lower end, either by disease of neighbouring structures or by operation. I have dealt with those groups first because they are the most prominent disorders of the small intestine in the daily work of a gastro-enterologist. The main parts of the jejunum and ileum, except for sharing in a general gastro-enteritis, are, as already mentioned, seldom the seat of an intrinsic disorder which affects health. At Ruthin Castle, excluding peptic ulcer and its complications, also the secondary mechanical deformities above discussed, and acute obstruction, out of 8,900 patients of all kinds affections of the duodenum, jejunum, and ileum were recorded in 265—about 3 per cent. The affections found were:

Diverticula, duodenum	176	
„ jejunum	20	
„ ileum	33	
„ Meckel's	5	
		234
Duodenal ileus		11
Tuberculosis		9
Regional ileitis		4
Foreign bodies		3
Intussusception		3
Actinomycosis		1
		265

If duodenal pouches are excluded, affections of the jejunum and ileum were recorded in eighty-eight patients only, 1 per cent. of the whole.

Diverticulosis

Diverticula of the small intestine furnish much the largest group. These are fairly common in the duodenum, less so in the jejunum and ileum. The *duodenal pouches* varied from a tiny protrusion to a bag over four inches long. We have seen them grow in size in the course of years. Most of them do not give rise to symptoms, but some do (Spriggs, 1937). These symptoms are as follows. A feeling of fullness, discomfort, or pain, having a similar time relation to food as that of duodenal ulcer, but usually without food relief. The pouch may be tender. Severer and rarer symptoms are a more constant ache, nausea, and vomiting. I have seen also haematemesis and jaundice from pressure on the common duct. A pouch may penetrate and affect the pancreas. O. A. Marxer and myself (1920–1, 1925–6) have published detailed accounts with radiographs.

Treatment is often successful in allaying symptoms. It is "directed to the lubrication, cleanliness, and proper action of the bowel, and the health of the body generally." A plain diet is given, not excluding greens and fruit if well chewed or sieved, paraffin, a pure culture of *B. acidophilus* in sterile milk, kerol or sodium sulphocarbolate, carminatives as needed, and attention to the colon. Regular rests and walks, faradism, or gentle abdominal exercises, but not abdominal massage, are also prescribed as needed. A few severe cases have been treated by operation. The pouch is not obvious, lying behind the peritoneum. It should not be tucked in, but excised, or a short circuit made.

Jejunal pouches are much less common. We have seen twenty cases. They are usually large, like the duodenal ones, and are relatively more often the cause of disturbance. Thus in fifteen of the patients, some of whom also had a duodenal pouch, flatulence, abdominal discomfort, nausea, and eructation were complained of. Three had headaches and two diarrhoea. The chief sign is intermittent distension. I have had patients with a number of largish jejunal pouches whose symptoms made them miserable, but these were moderated by treatment similar to that outlined for duodenal diverticula. Haemorrhage occurred in two. Operation was advised in one, and the bleeding was found to have come from a duodenal pouch that was also present. A gastrojejunostomy, made below all the pouches, gave permanent relief (Spriggs and

Marxer, 1925–6). Occlusion with inflammation of a pouch causing obstruction has been described (Fraser, 1933–4). Fig. 1 of the Plate illustrates large and small jejunal pouches in the following case.

Case II.—A man aged 64. At 34 he had three appendical operations; at 42 repair of abdominal hernia. Has been dieted and treated for indigestion with various diagnoses. On admission complained of constipation, weakness, loss of weight, flatulence, eructations, and distension, worse when "stomach empty," wakes him in night. Diagnosis: arteriosclerosis; jejunal diverticula, large and small; moderate anaemia and punctate basophilia. Treatment: lacto-vegetarian diet, small varied dose of paraffin three times a day before food. Blaud's pill, liver extract, gastric "self-lavage" with weak alkaline solution, faradism to abdomen. Progress: in five weeks much less flatulence, though still some; gained 18 lb.; the pouches were seen with *x* rays to empty better than on admission.

The punctate basophilia persisted at later visits, as did some anaemia. My colleague, Dr. J. H. Anderson, had therefore an analysis made of the drinking-water of the patient's house, in which lead was found.

Diverticula of the ileum, and indeed of the lower jejunum, approach in character those in the colon—that is, they are small, and in the course of their development an irritative prediverticular state can sometimes be recognized. These little pouches have been detected in the terminal part now in thirty-three patients. They have not been seen to retain their contents as in the colon, but evidence of inflammation about them—for example, adhesions—has been observed in a few. The symptoms are of a different order from those arising from the duodenum or jejunum. Over a third of the patients complained of wind, discomfort about the navel or in the iliac fossa, griping, and irregular loose motions; these symptoms were not otherwise explained. In four there was local pain and tenderness. In diagnosis other causes of irritation of the terminal ileum need to be distinguished, and among these are inflammation extending from the colon or appendix, caecal growth, tuberculosis, regional ileitis, and actinomycosis. These disturbances yielded to treatment by regular habits and paraffin. Some also received intestinal douches. Paraffin is valuable in any local irritation of the lining of the small intestine and probably of the appendix as well, when inflammation has not gone too far. In one case discomfort recurred on relaxation of treatment. The appendix, which we had thought innocent, was removed elsewhere, in vain. On re-examination the diverticula and irritation of the terminal ileum were still present, and on resuming the simple regimen the symptoms again ceased. In seven other cases the appendix had been removed before admission, in three recently and without relief. Indeed, although that organ can be demonstrated radiologically with a careful technique in 85 per cent. of people, as O. A. Marxer showed twenty years ago (Spriggs and Marxer, 1919), its excision, without a proper examination, is still often the first step taken in any obscure or chronic abdominal disorder.

Meckel's diverticulum occurs in about 2 per cent. of humans, and should have been there in 120 out of 6,000 *x*-ray examinations; or, as earlier examinations paid less attention to the small intestine, in twenty of the last thousand. It was detected five times in this series, and is probably not easily seen with *x* rays unless it is diseased. In two of these, excision led to relief of symptoms.

Tuberculosis

Ulceration secondary to phthisis was suspected several times and proved in a few patients. We used to think that tuberculous ulceration was necessarily a final stage, as indeed it often is. I have seen in later years a clinical recovery from symptoms. In three patients the small intestine was involved in a tuberculous tumour—two of the ileo-caecal region and one of the transverse colon. In each there was a short history of acute intermittent pains becoming more continuous; and no phthisis. A movable mass could be felt in one of the ileo-caecal cases. The lesions were demonstrated by radiographs, and recovery followed resection.

Regional Ileitis or Crohn's Disease

This is a chronic local inflammation of the jejunum and ileum, generally the lower ileum; the affected part or parts become thick, oedematous, and rigid, and then narrow, ulcerated, or fistulous. The symptoms may simulate inflammation of the appendix, which has usually been removed without benefit, diverticulosis of the terminal ileum above described, and chronic enteritis or colitis. Wasting follows and infantilism is recorded, cured by resection (Logan and Brown, 1938). Sometimes a macrocytic anaemia develops if resection is not done (Brock, 1939). These cases call to mind the anaemia recorded after multiple tuberculous strictures. The lesions can be demonstrated by an *x*-ray examination specially directed to the small intestine.

The description of Crohn *et al.* (1932) has made clearer some obscure cases. I remembered at once two former patients, and two others have been admitted since. Chronic pain and distress were pronounced in all, with wasting and anaemia. In one a partial resection had been done of what was believed to be a tuberculous induration, but on section of tissue there was no evidence of that disease. The complaint apparently recovered for a time, but death took place with diarrhoea four years after operation. In another case I advised operation, but was not present. Three patches of "hyperplasia" were found in the middle of the ileum. They were assumed to be tuberculous and were not resected. A patch is not necessarily tuberculous because it has fine granules on the surface: these may not be tubercles. Under the microscope, also, giant cells alone are not evidence of tuberculosis unless there is the typical picture of a tubercle, or acid-fast bacilli are demonstrated.

Recovery may follow a short circuit or resection. I should like humbly to suggest that it may be of value to the patient for the physician to be present at any operation which he advises. The patient regards an operation as a defined procedure, and does not know that that consultation held when the parts are exposed may be the most important of all. In cases of doubt at operation the mucous membrane should be examined.

Duodenal Ileus

There were eleven cases of chronic duodenal ileus, sometimes a perplexing condition, especially because symptoms may be intermittent, coming on at periods of overtiredness or strain, just as do the symptoms associated with a more general visceroptosis. Distension and vomiting occur. A partial obstruction at the duodenojejunal junction can be detected with radiographs, in the erect position; if the duodenum is dilated, that is confirmatory evidence, but it may sometimes distend a good deal without obstruction at the flexure. In a typical case symptoms cease for the time in the knee–elbow position or by simply lying supine or prone. Tonic treatment, with rest, a holiday, and a belt, relieves some. A severe case may need a gastro-enterostomy. In one such the flexure

was kinked above an aberrant branch of the mesenteric artery (Spriggs and Marxer, 1937).

Intussusception and Actinomycosis

We have seen three cases of intussusception of the small intestine. In one the jejunum passed at intervals into the stomach through a gastro-enterostomy. This caused a burning scarified feeling which recurred on and off for four years. It was relieved by some foods, and always by a rest and holiday with general treatment. This patient has now been free of the sensation, and, at observations, of the intussusception, for six years. The second patient gave a four-years history of sudden nausea, vomiting, and pain, and on one occasion melaena. She had been treated for duodenal ulcer without benefit, and came to the clinic for investigation. Fortunately, an attack occurred in the *x*-ray room and the intussusception was seen. The infolding of the upper jejunum reduced spontaneously, and at operation was found to be due to a small adherent gland. Adhesions were separated, and there was no recurrence. In the third case, which is under observation, the terminal ileum passes into the caecum, with mild discomfort.

Actinomycosis involving the ileum occurred in a man of 28 who had had large amounts of fluid, containing the fungus, taken from the peritoneum before admission. Intensive treatment with iodide had given relief. The lesions of the intestine could be seen in the radiographs. With a quiet regimen and withdrawal of morphine the symptoms improved. A haemorrhagic cyst then developed about the pancreas after a trauma—namely, hitting the ground hard with a mashie, which caused acute pain. This was operated upon successfully. But after some months fresh pains developed, and a year later it was reported that death had followed repeated operations.

Growths and Foreign Bodies

Primary growths of the small bowel are rare, and are varied in nature. A short summary of those which have been observed is contained in a paper to which I have referred (Spriggs and Marxer, 1937). Secondary growths are usually at the later stage of a general dissemination. Pressure or extension from a neighbouring growth is not uncommon. Pain may be reflected towards the root of the mesentery and up to the left hypochondrium.

In one patient a gall-stone caused acute obstruction. In two others tapeworm and roundworm respectively were detected in the terminal ileum by O. A. Marxer with the aid of radiographs. The symptoms disappeared with appropriate treatment.

Summary

The acute diseases of the small intestine include gastro-enteritis, typhoid fever, and acute obstruction.

Most of the chronic disorders met with in practice are due to peptic ulcer and its treatment by anastomosis with the jejunum, or to mechanical interference with the lower ileum from inflammations or operations in that region. Patients in the second group have not infrequently been labelled colitics or neurasthenics. A detailed clinical and radiological study is needed to determine the nature and site of the lesion. If an exact diagnosis can be made much relief is given by medical means in most, and by surgery in others.

Chronic intrinsic diseases of the small intestine occurred in 3 per cent. of a series of 8,900 patients, and were, in order of frequency, diverticulosis, duodenal ileus, tuberculosis, regional ileitis, secondary growths, intussusception, primary growths, actinomycosis, and foreign bodies. If duodenal pouches are excluded the frequency of an intrinsic disease of the jejunum and ileum was 1 per cent.

The symptoms and treatment of each group are briefly reviewed.

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INDUSTRIAL INCAPACITY AND MODERN MEDICINE*

BY

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The greater part of incapacitating sickness in this country is probably due to factors over which industry has little or no control. We have to remember that the workman spends only one-third of his life at work, and that during the remainder of his time powerful influences having no direct connexion with industry can affect his health. We know, of course, that injury and occupational disease can result in absence from and incapacity for work, and that other industrial factors, such as long hours, poor lighting, noise, and fumes, may in themselves be a direct cause of sickness, but it is impossible with our present knowledge to estimate what proportion of the total sickness of any section of the population is due wholly or partly to such conditions.

Incidence of Sickness

There is great difficulty in obtaining any accurate figures of incapacitating sickness in our various towns and districts, and a similar difficulty in obtaining sickness rates in different firms and factories. In the majority of cases they simply do not exist. Speaking generally, however, there is an average absence from work among the insured population of Great Britain of ten days for men and twelve days for women annually, estimated to be equivalent to an entire year's work of some 600,000 persons. These figures do not cover those absences of three days or less for which sickness benefit is not paid, and they include not only industrial workers but commercial, domestic, and other employees.

In the recent report of the Department of Health for Scotland (1939) more accurate figures are available. The

* The second of two Milroy Lectures, delivered at the Royal College of Physicians, February 23 and 28, 1939. The first lecture was published in last week's issue, at page 963.

average duration of incapacity in an insured population of about 1,800,000 persons was approximately fifteen days, chronic invalidism among a small group—and this is a most significant fact—being mainly responsible for a high proportion of the total number of days lost.

In a group of some 12,000 workers in the Midlands the average incidence of sickness during 1938 was seven days for men and twelve days for women, and the figures for the past four years are given in Table II. These figures

TABLE II.—*Sick Absence Rates in a Group of Workers employed in the Metal Industry (1935–8)*

Year	No. of Employees			No. of Days Lost per Worker per Annum		
	Male	Female	Total	Male	Female	Total
1935	7,317	2,683	10,000	7	11	9
1936	7,498	3,018	10,516	7.9	12.6	9.2
1937	8,455	3,016	11,471	8.7	11.8	9.8
1938	8,908	3,272	12,180	7	11.8	8.2

represent the incidence of lost time due to sickness generally, and are exclusive of specific occupational disease and accidents ; nor do they include sickness among the clerical and administrative staff. This absence occurred in a group of workers engaged in the same type of trade—the non-ferrous metal industry—but containing a large and varied number of occupations, from the heavy refining and casting of copper to the repetitive machining of the metallic parts that go to make up the modern zipp-fastener. These men and women live in different areas of the Midlands, mainly in the Birmingham district, but also in Wolverhampton, Manchester, Leeds, Sheffield, and Swansea. In the factories in each of these areas the incidence may differ, for a number of reasons. In some cases there may be a considerable annual labour turnover, because of the periodicity of commercial activity and trade conditions generally. (By " labour turnover " I mean the percentage of workers that leave in one year of those taken on during the year.) In a number of factories the percentage of older workers, of juveniles, or of married women may be higher than in others, and because of these and other factors no conclusions will be drawn from the figures at this time.

Some Industrial Factors in Ill-health

There is no doubt that work, and industrial conditions generally, have an effect on health. We all know how unemployment affects moral and physical strength. And, again, we understand the relationship of satisfaction in work to health. The lack of incentive in effort, no matter what the remuneration, frequently leads to loss of interest and to breakdown. But in addition to these general principles there are certain conditions within industry which have an effect on the individual that is often a most important background to the subjective signs of ill-health.

It is frequently said that the stress and strain of industrial life is greater now than it ever has been. But if one analyses this statement, is it really so? There seems to be much that can be said on both sides. I often wonder if the compensations of to-day do not outweigh the possible increase in such stresses. Conditions of work have improved. Opportunities for amusement and recreation are greater. Transport and travel services have opened a new vista to the people. Repetitive work has increased no doubt, and the worker is often described as " a cog in the machine " ; but actually the present generation of girl seems to like repetitive work. It suits her, it is relatively well paid compared with domestic service, it gives her an opportunity to think her own thoughts and even to daydream, and her hours of work are limited. There is the additional fact also that young girls rarely consider such occupation as a life's work. For these reasons they are well content to take on jobs that would be thoroughly loathed by men and boys.

On the other hand, there has been a definite rationalization and concentration of industry within recent years. This is an age of big mergers. There is a tendency, therefore, to diminish the master–servant relationship which so often produced the highest form of faithful service and work. The feeling of insecurity is still frequently present, and especially so because of the large numbers of unemployed. There is a speeding up all round, and competition in trade tends towards " production at all costs " —often at the cost of health. The increased employment of women in occupations where marriage means loss of earning power raises for young people a conflict involving a most powerful instinct, and has hitherto received little notice as a probable factor in breakdown. Housing has become related to industry as never before, and the problem of the location of industry generally has a bearing on health. Factories are still being built in overcrowded areas with no consideration for the human problems involved. Sir Malcolm Stewart, in his last report as Commissioner for the Special Areas, recommended that no more factories should be allowed to open in the London area. He asked, in fact, that the State should openly intervene to control the location of industry and undertake the work of industrial slum clearance.

Travelling to work and travelling in general have become not only complicated and expensive in the large towns but more nerve-racking. In the London Passenger Transport area it has been calculated that in the year ending June, 1937, £16 3s. was paid per family in fares ; and £8 17s. per family in Birmingham during 1936. But in a small town during a similar period only about £2 to £3 was paid. And then there is noise—the noise of buses, traffic generally, and of trains. It has been shown, for example (and I am now digressing somewhat from my main theme), that in the carriage of a London tube train travelling at 30 m.p.h. the noise is such that an adult lion eighteen feet away roaring continuously would be inaudible. To escape into the country from the great cities is becoming increasingly difficult. With the demand for land by industry and speculative builders, how long will it be before the seven acres of playing fields per 1,000 of the population, which the National Playing Fields Association consider to be necessary, is realized?

The fact that many men and women have to travel long distances to work has also a direct bearing on their health. Early rising is necessary to get to work by eight o'clock. And so often this is accompanied by no breakfast, the worker being content, perhaps, with a hastily consumed cup of tea, sometimes heated up from the night before, and bread-and-jam, but more often just the tea alone. About 9.30 to 10 a.m., and again in the middle of the afternoon, the need is felt for nourishment and rest ; and if the employer is wise he arranges for a break of ten minutes in the middle of the morning and afternoon work spells, and also provides facilities for the worker to eat something brought from home or bought off a trolley, such as a hot drink of tea or cocoa or milk. In my own firm these desirable modifications have been introduced, and have proved to be of value in reducing fatigue, particularly in repetitive work among girls. At the same time output has not been diminished.

Then there is the problem of the person in authority. By a lack of understanding and inherent inability to command, by personal defect in character or merely by sheer ignorance, such a person can make life a positive hell for those under him. And this holds good in all departments of industrial management, from the top downwards. Unfortunately such persons do exist to-day, and they are directly, although as a rule quite unconsciously, the cause of mental breakdown in many people. It should be noted, however, that such a breakdown may not always result in absence from work; it produces in some persons a permanent state of subfitness which is a true incapacity and as significant as the major physical disease. On the other hand, the man in authority who has understanding and some knowledge of the problems of human nature does much, and again unconsciously in many cases, to inspire confidence, to make work a real part of the art of living, and to produce directly that feeling of well-being and contentment so essential to full health.

And then there is a class of person who has frequent breakdowns in health because of nervous or neurotic tendencies. In complaining to the doctor they unconsciously stress physical symptoms that are not the real cause of their trouble. They react to the external stress of industry and occupation by the development of a nervous illness, or, if they do escape an actual breakdown, carry their symptoms with them throughout their working life. The anxiety state so frequently found cannot be regarded always as a neurosis, for it may be a reasonable reaction to the patient's mode of life, and industry may be in need of adjustment as much as, and often more than, the worker himself.

Conditions of work—for example, the number of hours worked per week—also affect health. The extent of overtime for women and young persons is limited by law, but there is no legal limit to the number of hours that men over 18 years of age can work, although mutual agreements limiting the amount of overtime that can be worked per month have been made between some trades unions and employers' federations. Continuous night work also, which is prevalent in certain industries to-day, is a potential cause of ill-health. The strain of certain occupations in the heavy industries, such as metal casting and refining, excessive weight lifting, and outdoor work in all weathers, may also have a noticeable physical effect on certain men.

And then comes the question of lighting, heating, and ventilation, and comfort factors generally. In my experience lighting is more important than is often realized, and I have had occasion frequently to deal with complaints of eyestrain, headache, and general debility which have been directly caused by deficient or ill-designed lighting. Standards of lighting vary naturally for different occupations. On highly skilled fine work such as toolmaking, micrometers have to be read to a ten-thousandth of an inch and the work examined from all positions. For such work a high intensity of illumination is necessary, the light has to be localized, and there must be freedom from glare. On the other hand, for general labouring the intensity of illumination need not be nearly so high, and no local lighting is necessary; but there must be a reasonable illumination so that the work is safe. In this country there are as yet no generally accepted lighting standards as there are, for example, in the U.S.A.; but the Departmental Committee on Lighting in Factories has recently published a Report (1938) in which the work of standardization has been started. The good works engineer knows much about lighting because of its economic importance to production, and he may understand its significance in relation to the worker; but it often remains for the industrial medical officer to advise in some detail on such matters. For this reason, to take lighting still as our example, he must be able to use a photometer to back up opinion by evidence and to lay down suitable standards with the engineer for the various occupations in his factory. This is work that will repay well both in prevention of ill-health and in an all-round increase of efficiency.

Occupational Diseases

In many quarters the term "industrial medicine" has been taken to mean solely the study of occupational diseases to the exclusion of other aspects. It is therefore necessary to place such diseases in their true perspective in relation to industrial incapacity generally and to claim for industrial medicine a field of work and study which stretches far beyond the confines of disease.

In 1936 some £555,000 was paid out in compensation for occupational disease in the seven great groups of industries already referred to. This sum was paid to just under 20,000 cases, the bulk of which occurred in the mining industry as miners' nystagmus, beat-hand, and beat-knee. For cases of silicosis £173,500 was paid, giving a total of nearly £730,000. "Continued cases"—that is, the cases carried over from previous years—accounted for 70 per cent. of this figure. Industrial injuries for which compensation was paid occurred in the same groups of persons to the extent of some 440,000 cases, or approximately to a number twenty-two times greater, the amount of money being paid out in compensation being nearly ten times as much.

But when one considers the incidence and cost of sickness among industrial workers generally some sense of proportion can be arrived at. It has been estimated that the money value of the work lost annually by employees for which national health insurance sickness benefit is paid cannot be less than £100,000,000 a year, without taking into consideration the dislocation in industry. This is twenty times more than the direct cost of injuries, and nearly two hundred times more than the cost of occupational diseases.

In my group of 12,000 workers industrial disease occurred during 1937 in only seven persons, who averaged a loss of thirty-seven days—all cases of dermatitis, and one of them was off for 105 days. The total amount of compensation paid in these cases was £66. In this particular industry the risks of occupational disease are few, because of the nature of the work, but they do exist; for example, lead, chromium, solvents of all kinds, fumes, and toxic dusts. The co-operation of the employer and production managers and plant engineers with the medical service has done much to prevent its incidence. And one has only to study the Annual Reports of H.M. Chief Inspector of Factories to see that, comparatively speaking, the incidence of such disease in relation to the population at risk is low. Some 480 cases of poisoning were reported during 1937 (under Section 73 of the Factory and Workshops Act, 1907, or Section 3 of the Lead Paint Act, 1926), of which 141 were cases of lead poisoning, 183 of epitheliomatous ulceration, and 101 of chrome ulceration.

I do not suggest for one minute that industrial disease is relatively unimportant. Indeed, in many ways it is vitally important to some industries, and overshadows everything else—for example, in the potteries, in the dyestuffs industry, in certain coal-mines, and in the nickel-

refining industry. Generally speaking, however, occupational disease is under control in this country—thanks largely to our present legislation and to the work of His Majesty's Medical Inspectors of Factories, whose contribution to preventive medicine within recent years has been but scantily recognized.

Two facts stand out in connexion with this subject. First of all, these diseases would not occur if certain chemicals were not used by industry, and for this reason they appear to be a high price to pay for production; secondly, however, it is the very nature of things that industry must progress, and that new materials, processes, and products must continually be evolved, if we as a country hope to keep pace with international trade. And this is one of the strongest arguments for the employment of an industrial doctor where specific hazards and risks do occur. In collaboration with the plant engineer and works manager he can be largely instrumental in preventing trouble, and he can safeguard the worker by periodic examination and by detailed attention both to the hygiene of the individual and to that of the factory. In this way alone can certain industries progress; plant and process can be made safe for the workman, personal ignorance about the potential danger can be largely dispelled, research can demonstrate toxicity, and the end-result can be of benefit all round—to the employer, who can market his product and achieve yet another triumph for science, and to the worker, whose health is adequately safeguarded.

The Juvenile in Industry

One of the most important contributions that the industrial medical officer can make to health generally is the supervision of juveniles in the factory. Medical examination on entrance is important, but it must be accompanied by a follow-up system if satisfactory results are to be obtained. Under law the examining surgeon has to carry out a first examination, and if he is dissatisfied in any way with his findings he can re-examine the "young person" before giving a final certificate of fitness. The type of examination to be carried out is laid down, and is an undoubted improvement on the state of affairs that existed before the new Factories Act came into force. From the medical point of view, however, this work loses much of its possible benefit because it does not allow for systematic follow-up examinations. To state that the child—for such workers are no more or less than children—is fit for certain work on entrance to industry is certainly of value; but what do we know about the child's condition after three or six months? How do we know that he has not been transferred to some job completely beyond his scope? And what do we know to-day about the effects of industrial environment on the juvenile who has been precipitated into industry straight from school?

Very often, of course, the boy or girl of 14 or 15 is completely grown up in outlook and, it may be, in habit. There is little he may not know about life, and from an early age he may have been in contact with a sordid reality that is seldom experienced by our own children. Such conditions frequently obtain in our large industrial cities. But many children are not so sophisticated. Any precocity that they may show is on different lines, and to them the new life is all too strange. Overnight they become adults almost; they are wage-earners—that in itself is a thrill; they make contact with many different types of worker—maybe to their detriment; and they become part of an industrial community with all its potential influences for good and evil. The wise employer understands this, and provides facilities which do much to smooth the way during the young worker's early days. But, even so, the medical man or woman who is fortunate enough to have the opportunity is in the position to do just that amount more than the layman which can be so effective. All his training and experience fit him for work of this description.

In my group we started a follow-up system on a definite plan only in July, 1937, seeing the juvenile on entry, and after one, three, and six months, and thereafter at six-monthly intervals. But even in this short time we know that we are on the right lines and that personal contact with the boys and girls, and the supervision of their growth and development, physical and mental, have been happy in their results. It is too early to make any dogmatic statements about the investigation—incidentally our scheme was introduced primarily to benefit the young person and not as a scientific experiment—but, nevertheless, even at this stage we have come to some conclusions. They like coming to talk to the doctor; the parents are becoming interested, and often discuss points with us; boys grow and develop physically more rapidly than girls; many boys lose weight during the first month, girls hardly ever; facilities in the works for games of all kinds after hours are patronized to a much greater extent than by adults; many of them pay as much as one-third of their weekly wage on transport to and from work; teeth need attention in nearly 30 per cent. of cases; and, what is curiously significant, the annual turnover in juveniles has been reduced by approximately 20 per cent. These and many other points are gradually being elucidated, and as by this time we have examined upwards of 600 different juveniles, many of them on frequent occasions, some estimate of the potential value of the work can be made.

National Security and Industrial Health

In these days the most important issue with which we as a nation are concerned is the degree of our national security and preparedness for war; and no discussion of industrial incapacity and its relation to modern medicine would be complete without some mention of this fact. To bring about a state of security and to spend such large sums of money as have been voted have meant a great increase in activity in many industries. This has been accompanied by long hours of work and much fatigue. Over a short period of time—months or even a year—other things being equal, this need not take toll of health in the average man or woman. But in a state of war matters would change. Abnormal conditions of work would become those of every day, without hope of change. "Output at all costs" would be the slogan in a war dominated as never before by the machine. The occasional rush of business life would develop into a constant headlong skelter. And the man or woman in the factory would once again tend to become relegated to the background at the expense of production.

It took nearly a year of the great war for the Government to recognize the signs of human industrial fatigue and to realize that production was dependent utterly on man. How long will the period be in the next war? Surely now is the time to see that along with expert management and scientific research should go a parallel supervision of environmental working conditions, of the welfare of labour and conditions of work, and of the immediate health risks and hazards which arise. Of all things the one to be prevented is the risk of industrial fatigue in a future emergency. Yet to what extent is this being considered to-day and being undertaken by the

country as part of its defence policy? In some industries there is a well-established regard for human relationships exemplified by progressive welfare schemes and working environment, and a knowledge of health problems; but unfortunately these schemes affect only a proportion—probably not more than one-third—of our industrial population. Much work has got to be done, and much of it by the medical profession, because the problem is essentially one of preventive medicine along lines that, quite frankly, have hitherto been unexplored.

The Need for Knowledge of Industrial Life

The subject of these lectures is so comprehensive that it has been impossible in the time at my disposal to cover all the ground. There are many other points which I should have liked to discuss—for example, the problem of the epileptic, the return to work of the tuberculous patient, the place of the diabetic in industry, and the many aspects of research into the potential toxicity of substances and processes. And then there is that part of the industrial medical officer's work which has to do with examinations within the factory clinic, but which has been referred to in some detail on another occasion (Stewart, 1938); examination of applicants for employment, of employees before transfer to hazardous work, or of those who suffer from disabilities such as heart disease, hernia, or malnutrition, and who need to be kept under periodic medical supervision. But before I finish I should like to emphasize as strongly as I can one further point—namely, the need for a fuller knowledge of industrial life on the part of the medical profession to-day and for a knowledge of the patient as a man or woman with a vivid background of work. If we agree that industry can contribute to health as well as to disease, then the more fully we teach that the better. In a number of postgraduate schools, notably the London School of Hygiene, D.P.H. and other students are given an opportunity to learn something of the physiology and psychology of work; but so far the undergraduate has been restricted to a brief study of industrial diseases, and that was recommended by the General Medical Council only a year ago.

And again, some understanding of the needs of the worker can have an effect on hospital policy. The man or woman in the factory or in business who cannot afford to do otherwise than attend hospital for advice and treatment must do so in working hours in order to see the specialist; and by doing so he loses time and wages. Is it not possible that the frequent long wait in hospital could be reduced by the introduction of an appointment system, or even that hospitals in busy industrial districts could provide evening clinics? Further consideration of these two points is urgently required.

Then there is the return of the sick man to work. His rehabilitation is often as important as that of the man who is severely injured. In this, above all things, the medical practitioner can be of the greatest help to his patients. For him a knowledge of industrial medicine is not so immediately important as a general recognition of the common sociological facts of life, an understanding of the significance of housing, feeding costs, labour conditions, wage rates, and the like; all these form what is in reality an essential background to the medicine of our generation.

Conclusion

I wish to plead once again for further consideration of many of the points which I have raised. My appeal must first of all be to the employer, be he large or small, to set up for himself some form of medical service. And may I say now that the issue is not primarily one of expense. I believe, and many employers believe, that medical services in industry are first and foremost a good investment and not a philanthropic institution. The preservation of the health of the worker is as essential to industry as the maintenance of the machine; and hand in hand with production research must go planning for health. There must be a further infiltration of medical thought into industrial management, and this can only be brought about by a direct effort on the part of our profession. But the effort to be effective must be put into the language of industry, and above all must be practical in its basis.

Labour management to-day is more and more calling in the help and advice of doctors on all sorts of matters affecting the worker. We have seen some of the ways in which, within my own experience, this help has been given. And we have seen, too, that the assistance required is not by any means always that of the doctor within the factory. Co-operation of general practitioners, of public health services, of medical and surgical specialists, and of hospital authorities is vitally necessary. The worker's labour is his means of livelihood. His hands and his health are his capital. Livelihood can be preserved by industry, but health and capacity for work are traditionally preserved by us as a profession.

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HEALING BY NATURAL RESOLUTION IN PULMONARY TUBERCULOSIS WITH OR WITHOUT CAVITATION*

BY

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(WITH SPECIAL PLATE)

Before introducing this plea for initial conservative treatment in exudative pulmonary tuberculosis I would like to point out—what will, I know, be readily appreciated—that it is impossible here to touch more than the fringe of this very important subject.

Previous to the days of chest radiology, enabling us to perform as it were an autopsy of the living subject, only three possibilities in the development of a tuberculous lesion were really recognized—namely, caseation, leading as a general rule to lung destruction with cavity formation ; fibrosis ; and calcification, the last two being natural methods of healing.

Possibility of Certain Tuberculous Lung Lesions Healing by Natural Resolution

Although Richard Morton actually suggested this in his *Phthisiologica* as long ago as 1689, it has never really been appreciated, since it escaped the notice of the morbid anatomist, and necropsy findings were invariably relied upon. Under present-day conditions any clinical observations can receive confirmation by chest radiology, to which we clinicians owe so much of our modern conception of chest disease. Clinical and radiological observations of the chest show us that any fresh tuberculous, pneumonic, or bronchopneumonic process of the recent exudative type may actually heal by resolution in a manner comparable to that observed in lobar pneumonia and bronchopneumonia. There is, however, this distinction: the time factor for resolution in a tuberculous lung lesion is much more prolonged, requiring perhaps months instead of days or weeks of complete bed rest.

Much of the pioneer work on healing by natural resolution is due to Jaquerod of Leysin, and it is to his inspiration that I owe my interest in the subject during the last thirteen years. In a joint paper (Jaquerod and Ellman, 1927) we made reference to the " radiographic appearances of tuberculous pneumonia and bronchopneumonia " and its healing by natural resolution.

Possible Explanation of Natural Resolution

Amberson (1936) and other observers have regarded those exudates—they are as a general rule recent ones—which show this tendency to resolution as being of a perifocal nature with macroscopic and microscopical central characteristic tuberculous lesions surrounded at the periphery by appearances revealing comparatively few giant-cell systems and even fewer tubercle bacilli. A possible relationship of some of these fresh exudates to the mild course of inflammatory lung changes in infants, described by Eliasberg and Neuland as " epituberculosis," has also been suggested.

In my experience, which coincides with that of other observers, these fresh exudates occur more particularly in the first three or four decades of life, are largely confined to the upper lobes of the lung, and tend at the onset to exhibit a general constitutional rather than a local symptomatology. In an extremely acute case massive necrosis may take place, and the question of resolution does not then arise ; but adult phthisis in its early manifestations is, so far as the lung is concerned, principally a localized disease, and this enables the body to put up some resistance to the invasion of the bacillus. Prolonged rest, both general and local, will assist the maintenance of this naturally acquired immunity.

In considering the treatment of an early case of pulmonary tuberculosis it seems to me that we should ask ourselves the following questions: (1) Is this the type of lesion which is likely to show a natural tendency to resolution? (2) Under what conditions is this resolution most likely to be achieved? (3) What is the time factor likely to be? (4) Are clinical, pathological, and, above all, radiological facilities available for controlling the above factors?

Resolving Non-tuberculous Lesions

It is, of course, well known that many lesions seen radiologically may closely simulate those of a tuberculous exudate. It therefore becomes imperative, in the interests of scientific accuracy, that we shall not attribute the process of natural resolution to tuberculous lesions when, in fact, they may be due to such conditions as atypical resolving pneumonia of an acute, subacute, or chronic nature—as described by Scadding (1937)—to suppurative pneumonitis, etc. I think it is now recognized that there is a type of recent exudative lung tuberculosis which will heal by natural resolution and produce permanently good results when well-supervised bed rest under the strict discipline of the sanatorium regime can be obtained. For results to be achieved, however, it must be positive bed rest, or, if absolute " Patersonian rest " is an impossibility, it should be as near an approach as practicable for the first two or three months, with subsequent modification. It is essential that serial clinical and radiological investigations should accompany this treatment for it to be successful. The personality of the physician also plays an important part in securing the co-operation of the patient, which is more easily obtained when a careful explanation of all that is involved is made at the beginning of treatment.

In my experience the danger of spread in these cases, except in very acute ones, is often overemphasized, and it is not, moreover, necessarily eliminated by collapse therapy. If it is apparent that spontaneous healing is taking place, then bed rest with *x*-ray control should be encouraged ; if, on the other hand, there is no progress, or there is retrogression, then collapse therapy can be induced.

I yield to no one in recognition of the value of many recent advances in the treatment of pulmonary tuberculosis, especially in collapse therapy either by artificial pneumothorax or by surgical means, which methods I never hesitate to employ in suitable cases. Furthermore, as the technique of the thoracic surgeons improves yet further there is little doubt that surgical collapse is likely to become increasingly effective. New advances must, however, be regarded primarily as adjuncts to the older methods of treatment, such as rest therapy and the strict sanatorium regime, which they can indeed never replace. Thoracic surgeons themselves are in fact becoming increasingly conservative-minded, are starting to make real use of their stethoscopes, and are recognizing that there is a general constitutional factor in pulmonary tuberculosis as well as the local lesion in the lung.

* Paper read before the Tuberculosis Association, February 19, 1939.

Is there not, however, in these days of hustle and speed, the risk of a false sense of security being engendered by a surgical procedure which may so influence the patient that he loses a sense of proportion and leads such an active life that healing, in the long run—that is, over a period of years—is in fact delayed? The more I see of cases of early recent exudative lesions the more convinced do I become that they should in the first instance be given an opportunity of healing by simple methods with careful radiological control, and that immediate collapse therapy is not always justifiable. An artificial pneumothorax, for example, that is induced prematurely may prove to be contraselective and may require yet further intervention, culminating finally in a thoracoplastic operation. On the other hand, in selected chronic bacilliferous cases surgical intervention may well prove a life-saving device. Surgical intervention is, after all, merely a means of reinforcing rest by mechanical splinting of the lung, and it would appear to be axiomatic that if complete and prolonged rest can, unaided, produce the desired results it should certainly be the initial method of choice.

Spontaneous Healing in Cavities

In the treatment of pulmonary tuberculosis one of the most important factors is the elimination of cavities, which should always be looked upon as a serious menace. There are two schools of thought regarding their treatment. Some advocate early immediate compression of all cavities, while others favour initial bed rest in cases where fresh cavities seem to be of the exudative type, although the problem of assessing the type of cavity from the *x*-ray appearance is not always so simple. As our president observed in his admirable presidential address, the density or thickness of the wall of a cavity is no indication of the degree of fibrosis.

The principles of healing that have been enunciated in regard to non-cavitating lesions apply also to cavitation, and, as a rule, retrogression of the lesion and healing of the cavities accompany each other. Speaking generally, we may say that recent exudative cavities respond more favourably to strict bed rest, and that the older and more productive a cavity is the more likely is it that some form of surgical intervention will be necessary. In view, however, of Hebert's (1939) dictum, I am of the opinion that, at the beginning, most cavities should be given the opportunity of responding to bed rest; here our procedure can be guided by serial radiography, which will enable us to follow with some degree of precision their behaviour and estimate their likelihood of healing spontaneously. Subsequently, if the lesion is retrogressing or remains *in statu quo*, let us then consider collapse therapy. Bacmeister (1927) has shown that 14 per cent. of cavities healed spontaneously; McMahon and Kerper (1933) in a study of 296 cases showed that 22 per cent. healed spontaneously; while Fales and Beaudet (1931) obtained spontaneous healing in 40 per cent. of their cases within twelve months.

In dealing with cavities, therefore, it seems that our first duty is to ask, "What can we expect by way of spontaneous healing, and what are our criteria for such healing?" These criteria are, in actual fact, cavities no longer seen radiologically and a bacilliferous sputum becoming negative.

Mechanism of Closure of Cavities

Jaquerod pointed out in 1924 that healing of cavities was necessarily accompanied by obstruction of the bronchus leading to the cavity. Bronchographic studies have tended to confirm this; but there is little doubt, from the excellent work of Coryllos and others, that pathological changes within the bronchial lumen have an important bearing on the question of the healing of tuberculous cavities, both in cases of spontaneous closure and of collapse therapy.

How can it be explained that while some cavities heal spontaneously others are resistant to both artificial pneumothorax and thoracoplasty, while yet others may grow larger in the artificially collapsed lung? One is led to believe, with Jaquerod, Coryllos, Ornstein, and other observers, that the evolution of cavities is dependent on the state of the draining bronchus. In this connexion Brooks's (1938) recent ingenious introduction of a distended balloon through a bronchoscope is not without significance in the treatment of certain cavities. Coryllos and Ornstein have made a special study of cavities by the following methods: by the direct examination of the cavity with the cavascope; by gas analysis of air in a cavity; by clinical study; and by surgical attempts at closure. They hold the view that complete closure of the draining bronchus of a cavity with obstructive atelectasis is the only means by which cavities can heal, no matter what the size of the cavity or the nature of its wall. Directly opposed to this, however, is the school of thought headed by Ameuille (1926).

For my own part, I am impressed by the exceptionally rational explanation of Coryllos and Ornstein (1938), who classify cavities, according to the closure or patency of the draining bronchus, into: (1) positive pressure or closed cavities, which are nearly always thin-walled and spherical in shape, with bronchial obstruction, positive pressure and retention of fluid in a patient who shows little toxaemia, whose general condition is good, and in whom the cavity tends to heal spontaneously*; and (2) atmospheric pressure or open cavities, where there is an absence of retained secretion, which do not tend to disappear spontaneously and may prove resistant to collapse therapy. Type 1 may sometimes become Type 2, the positive sputum becoming negative, with a corresponding improvement in the general condition of the patient. This theory of the patent bronchus permitting free circulation of air into the cavity, and hence an adequate supply of oxygen favourable to the growth of tubercle bacilli, appears to be very rational, and enables one to postulate that cavities are either open or closed, and that the latter, accompanied by bronchial obstruction, tend to heal.

Case Reports

Five only of the representative series of cases are here summarized, owing to limitations of space.

SPUTUM-POSITIVE CASES

Case I.—Female aged 21. Large haemoptysis, November, 1935. Clinical and *x*-ray examination of chest revealed scattered infiltration of the exudative type, involving the middle and lower zones of the left lung with a small cavity in the right infraclavicular region showing a horizontal fluid level (Plate, Figs. 1 and 2). Sputum contained numerous tubercle bacilli. On bed rest in sanatorium for eight months. Very good resolution, no sputum.

Case II.—Female aged 17. Acute adolescent phthisis. Exudative infiltration of upper and middle zones of right lung. Sputum positive. Temperature range, 97°–102° (six weeks). In sanatorium forty weeks. Good healing by resolution. Sputum persistently negative. Gained over 1 stone in weight.

Case III.—Male aged 37. September, 1936: exudative infiltration of upper and middle zones of left lung; sputum

* The cavities in my series which have healed spontaneously have been of this type.

positive (Figs. 3 and 4). In sanatorium for ten months, bed rest for six months. Now no sputum; considerable resolution.

Case IV.—Female aged 16. Adolescent phthisis. Large cavity in right upper zone with fluid level; sputum positive (Fig. 5). Artificial pneumothorax attempted, contraselective collapse obtained. A.P. discontinued. Bed rest in sanatorium for eight months. Several skiagrams during this period showed cavity becoming progressively smaller. Now completely healed (Fig. 6); no sputum, excellent general condition.

A SPUTUM-NEGATIVE CASE

Case V.—Female aged 45, first seen July, 1935. Cough, loss of weight (1 stone in two months), and lassitude for the last six months. Clinical and *x*-ray investigations showed evidence of infiltration of the upper zones of both lungs. Originally no sputum, but subsequently sputum was examined by all available methods and found negative for tubercle bacilli. On routine sanatorium treatment for twenty-four weeks and regular supervision subsequently. In May, 1937, no abnormal physical signs. *X*-ray examination showed complete resolution of the lung lesion.

Is Case V to be regarded as a chronic infiltration of lung tissue casting shadows identical with those of pulmonary tuberculosis and not apparently to be connected with the tubercle bacillus? The chronicity of this case shows that it is not quite analogous with those described by Scadding; but recent work reveals how much we have to learn about simple inflammatory processes in the lung, and that caution is necessary before results are attributed to a particular type of treatment.

Summary

A discriminating view on the treatment of pulmonary tuberculosis has been suggested, bearing in mind the two aspects of the disease—namely, the constitutional aspect and the local manifestation in the lung.

The tendency of certain fresh tuberculous pneumonic and bronchopneumonic lesions, with or without cavities, to heal spontaneously has been outlined.

The desirability of treating such cases by strict and subsequently modified bed rest with clinical and radiological control has been emphasized.

The prolonged time factor for the successful treatment of such cases by general and local rest and the importance of the complete co-operation of the patient are outlined.

The immediate institution of collapse therapy in such types of localized lesions is not justified, but may demand serious consideration if with serial *x*-ray control the lesions remain stationary or retrogress.

On the other hand, collapse therapy in cases of the productive type of disease should not be unduly delayed, and in certain cavity cases may prove to be a life-saving device.

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THE CAUSAL ORGANISM OF SOUTH AFRICAN "SANDWORM" ERUPTION

A PRELIMINARY NOTE

BY

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(WITH SPECIAL PLATE)

The "creeping eruption," or "sandworm" as it is known in South Africa, is a very common condition, particularly in Natal and Zululand. Up to the present time its aetiology has never been satisfactorily established. The purpose of this article is to illustrate a hitherto undescribed causal organism and to describe the procedure of isolating it.

The affliction is characterized by a thin inflammatory raised line or track about one-eighth of an inch wide, which increases in length as the parasite burrows its way in a tortuous manner through the superficial layers of the skin and produces a severe irritation (Plate, Fig. 1). The feet of children who play bare-footed are most commonly affected, but any part of the skin may be attacked, including the genital organs. The buttocks, too, are a favourite site. It affects natives as well as Europeans, and no age is exempt. The cases occur most often in the hot wet months of the year. Lay opinion that infection is incurred only on the seaside beach sand above high-water mark is not proved. In fact, evidence shows that persons who have not been near the beach at all have contracted it, and in one case seen recently it was associated with gardening. This man had been digging and transplanting cabbages at his home in Durban, where he developed a severe infection of both hands within a few days. The distribution in South Africa is not fully worked out yet, but cases seen inland have almost invariably been attributed to a holiday on the Natal coast.

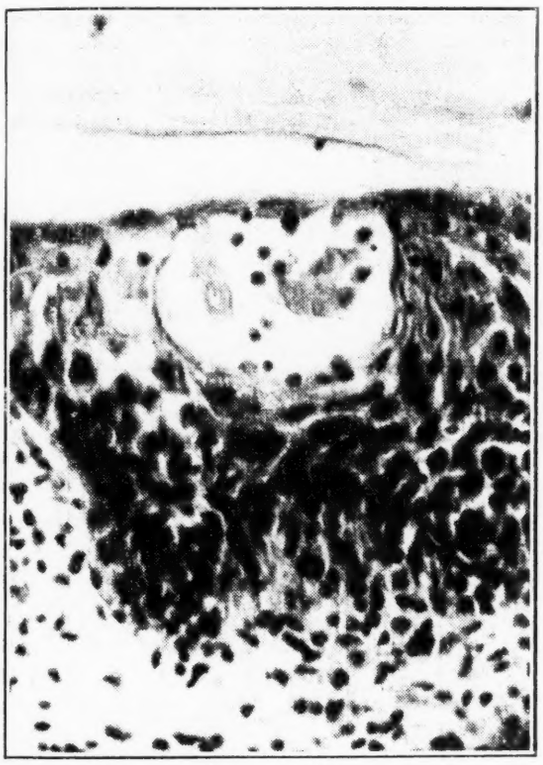
The infection is spread by scratching the parts to relieve the pruritus, and sepsis usually follows. The sepsis may be severe, and it has led to permanent scarring; one subject managed to transfer the infection from one hand to the other and then to the face, which became very painful and swollen, particularly about the chin and lips. During recent weeks eight cases have come to my notice, and I had the good fortune to have two adults who were willing to submit to the tedious process of looking for the causal organism.

Procedure of Search for the Organism

A dissecting microscope, some cedarwood oil, and a sharp eye-spud were used. The cedarwood oil clears the skin somewhat and permits an even incident light to be focused on the track. The capillary loops of the true skin are visible, and appear dilated below the burrow, due to reaction to the irritation of the parasite and any eggs or debris produced by it. It is also possible that a secretion by the parasite in the form of a lysin assists the fairly rapid tunnelling through the epidermis and contributes to the severe itching complained of.

The raised reactionary track, which is palpable and obvious to the naked eye, is much wider than the true burrow through the cells. The obvious track is about 3 mm. wide, but the true track is only about 0.33 mm. (roughly the thickness of a fine dental needle) until it becomes septic. It is superficial in its entire extent and

may show small pockets at intervals where egg-laying probably occurs. When the track through the skin is located the cedarwood oil is wiped off with xylol and the parts cleaned with ether or spirit. Using the eye-spud, the track is then laid open to its terminus, taking care not to draw blood, which obscures visibility. The drops of clear fluid in the burrow are transferred to a slide and covered with a cover-slip for examination under an ordinary microscope. A drop of distilled water on a clean slide prepared with Mayer's egg albumen facilitates the procedure. In this way I was successful in obtaining what appear to be four stages in the development of a



Cross-section of "sandworm" track in human skin. Photomicrograph of Dr. F. G. Cawston's case (1928). The track lies entirely in the superficial layers of the epidermis and contains numerous lymphocytes. The stratum corneum has been separated by artefact. Serial sections of skin in two of my own cases revealed the track in an identical situation.

parasite hitherto undescribed as a cause of "creeping eruption."

The investigation was begun with the idea of looking for either a fly larva (*Gastrophilus* var. or *Hypoderma*) or a larval dog-hookworm (*Ankylostoma braziliense*), both of which are quoted in the textbooks as a cause. A cursory examination under the microscope made it obvious that from the size of the true track the causal organism was likely to be much smaller than expected. No sign of the above-mentioned larvae was evinced in any of about thirty tracks examined. A number of slides were prepared from droplets taken from various portions of tracks in the skin of a man infected with "sandworm" (Plate, Fig. 1), and examination of these revealed a mite about 300 μ in length and two developmental stages (Figs. 3 and 4). Tracks in a second case—that of "sandworm" of the hand (Fig. 6)—after a patient search produced a similar mite (female) (Fig. 5) and a number of eggs (Fig. 2). The minuteness of the parasite and its transparency when unstained make it very difficult to be seen in the skin. To realize the size, it should be noted that the mite could be dropped into a pinhole with room to spare, and that its egg is little larger than a polymorphonuclear leucocyte.

Commentary

The attention of interested readers may be drawn to a note by Theobald which states: "It has been asserted by Haller that the Cape ailment (Port Natal sickness) is caused by mites, but this statement has been contested" (Fantham *et al.*, 1916). No mention is made of a "creeping eruption." The nearest resemblance, in the available literature, to the mite discussed in the present investigation is *Tetranychus molestissimus*, which is found in the Argentine and Uruguay on the under-surface of the leaves of *Xanthium macrocarpum*. It attacks mammals and men, producing severe itching, accompanied by fever in the latter (Fantham *et al.*, 1916).

The photographs of the various stages discovered must suffice for this article. Fuller details of the classification, life history, and occurrence are being prepared, and in a subsequent article the treatment will also be included.

Dr. J. Mackay, district surgeon, Durban, kindly referred suitable cases to me and provided the stimulus to investigate this common ailment. Mr. O. F. Gibbs, senior technical assistant, Government Laboratory, Durban, gave valuable advice in the photomicrography. I acknowledge my thanks for their assistance. I am also indebted to Dr. F. W. P. Cluver, deputy chief health officer, for permission to publish this report.

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OBSERVATIONS ON THE PERFORMANCE OF BLOOD-GROUP TESTS

BY

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AND

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Compared with other parts of the world blood-group investigations in this country have been few. In a recent series of papers Taylor and Prior (1938a, 1938b, 1939) have given some account of what has been done, have described in detail their investigations of family and unrelated material in England, and have shown by statistical analyses that their results agree with current genetic theory.

Below is a description of the technique used in the Galton Laboratory for the diagnosis of the blood-group factors A_1, A_2, B, O, M, and N, followed by observations on technical points mostly concerned with the M–N factors, the detection of which, authorities are agreed, is difficult and full of pitfalls for the inexperienced. At the present time there may be interest in such a communication coming from a unit which for more than three years has been devoted, almost exclusively, to work on blood-group factors. It may appear that the difficulties are overstressed and that the technique is elaborate; the workers in this unit are of the opinion that anything less well-controlled and less careful would not be good enough.

Blood-group tests on 1,073 unrelated persons, a sample we believe to be representative of the population in England, are reported and analysed: of these 1,073 tests, 422 have already been reported by Taylor and Prior (loc. cit.). Our technique undergoes slight modification from time to time, as in the case of the strength of red-cell

* Supported by the Rockefeller Foundation.

suspension, which has gradually increased to about 2 per cent.; the description below is of what we do at present.

Collection of Specimens

In most cases capillary blood, collected from finger or ear-lobe into 3.8 per cent. sodium citrate solution, is used for the tests; in other cases cells are recovered from blood clot, washed two or three times with saline solution, and resuspended. In all but a few instances cells are examined within thirty-six hours of being bled, and within a much shorter time if they have not to be sent from a distance. So far as possible samples are stored in the refrigerator; those which have been posted to the laboratory are washed in saline solution before being tested, although cells recently bled are not washed as a routine measure. The cell suspensions used are approximately 2 per cent., as judged by eye.

Performance of Tests

All tests are performed in small precipitin tubes, 2 in. × ¼ in. approximately. Equal volumes of reagents are used, measured by Pasteur pipettes graduated to deliver about 0.1 c.cm., and as diluent a 0.85 per cent. solution of sodium chloride in distilled water. In the tests for the A and B factors each tube contains one volume of the corresponding antiserum, one volume of cell suspension, and a further volume of saline; the saline is added to avoid pseudo-agglutination, as recommended by Landsteiner (1928, p. 905). In the tests for the factors M and N at least three anti-M and three anti-N testing fluids, prepared from the sera of different rabbits, are used, and it is the opinion of workers in this laboratory that the use of only one anti-M and one anti-N fluid would lead to errors in diagnosis: most authorities work with three of each type—for example, Wiener in America and Friedenreich in Denmark. As in the preparation of these testing fluids the original sera have been considerably diluted, the third volume of saline, used in the tests on the ABO system, is omitted; the tubes for the M and N tests contain only equal volumes of testing fluid and cell suspension. As controls, cells, the blood groups of which are well known, are included in each batch of tests, as it is essential to be certain that the reagents are reacting with appropriate cells, and *only* with appropriate cells. Among the controls there should always be cells of group O, cells containing the factors A and B, cells of the types homozygous M and homozygous N, and those of the heterozygote, MN. When the partition of the factor A into A_1 and A_2 is being made, control cells of the types A_1 and A_2 are needed. We always include controls of the following types, OM, ON, A_1M, A_1N, and BMN or A_1BMN, and are fortunate in being able to get them from colleagues in the laboratory. The OM and ON controls are included not only because they are of the type O, but because the particular cells we use tend sometimes to give a slight reaction—the OM with anti-N, the ON with anti-M, when the corresponding reactions of our A_1M and A_1N control cells are quite negative (see the OM control cells in Table I). A_1M and A_1N types are included to detect possible contamination with α. In addition, a volume of the cells from each person tested is mixed with an equal volume of saline and included as a control of the cell suspension. After receiving its reagents each tube is shaken sufficiently to yield an even suspension of cells, and covered with a small glass cap, which, it was thought, would prevent extraneous matter from falling into the tubes. The main usefulness of the caps, however, is in indicating, during the reading of the reactions, which tubes have been examined. The tubes are left undisturbed on the bench, at room temperature, for two hours, after which the readings are made.

Our system of scoring the strength of a reaction is very simple: ++ C (complete) is a reaction in which clumps of cells in a clear surrounding fluid are visible to the naked eye after the cell deposit at the bottom of the tube has been dispersed by tapping the tube sharply three or four times with the finger; ++ V (visual), a somewhat weaker reaction in which the surrounding fluid is not clear, but in which clumps are distinctly visible. No reaction is scored as negative until it is examined microscopically; for this purpose a small portion of the well-mixed contents of the tube is placed on a microscope slide and spread evenly thereon by means of the stem of the Pasteur pipette used for its transfer to the slide. No cover-slips are used. The film is viewed with a half-inch objective, and at least three fields are examined. A reaction showing very big clumps under the microscope is scored as ++, a reaction not quite so large as +, still less reactions as (+), and (+)w (weak) in descending order of magnitude; (+)w indicating a definite reaction in which there is a uniform distribution of very small clumps containing about six to eight cells. A specimen in which the cells are not distributed quite evenly, but in which there are no very definite clumps, is scored as a ?.

TABLE I

Cells Tested		α	β	Anti-M's 1	Anti-M's 2	Anti-M's 3	Anti-N's 1	Anti-N's 2	Anti-N's 3	α_1	Saline Controls	Results of Tests
Control cells	C.V.H.	—	—	++V	++V	++C	(+)	(+)w	?	—	—	OM
	R.T.	—	—	—	—	—	++V	++	++	—	—	ON
	E.W.I.	++C	—	?	—	—	++C	++V	++V	++V	—	A_1N
	G.L.T.	++C	—	++C	++C	++C	—	(+)w	—	++V	—	A_1M
	B.E.S.	—	++C	++V	++C	++C	++C	++V	++C	—	—	BMN
	Sh.	Used only as A_2 control cells								?	—	A_2
Unknown cells	1	++C	—	—	—	—	++C	++V	++C	++V	—	A_1N
	2	—	—	++	++C	++C	++C	++	++C	—	—	OMN
	3	++V	—	++C	++C	++C	++C	++V	++C	(+)w	—	A_2MN
	4	—	—	++C	++C	++C	—	(+)w	—	—	—	OM
	5	++C	—	++C	++C	++C	++C	++V	++C	++	—	A_1MN
	*6	+	++C	—	—	—	++C	++C	++C	—	—	A_2BN
	7	—	++C	++C	++C	++C	?	(+)w	—	—	—	BM

* A_2B result confirmed by titration with α.

As Table I is given the protocol of a batch of tests set up together. Actually there were twenty-four samples to be tested, the seven unknown ones in the table being chosen only because they show a great variety of groups. The very weak A reaction, which is found sometimes in cases of A_2B, is well illustrated.

Preparation of Antisera

ANTI-A (α) AND ANTI-B (β)

Anti-A and anti-B sera, obtained from suitable donors, are placed in amber-coloured glass ampoules and heated for twenty-five minutes at 56° C. on three successive days. The

ampoules are stored in the refrigerator at about 2°C. Before use the strength of the sera is determined by titration against cells containing the appropriate antigen, and for this purpose we use the precipitin tubes and the marked Pasteur pipettes previously described. The strength of the cell suspension is held constant, the serum dilutions being increased twofold at each stage. The reciprocal of the highest dilution of the serum giving a reaction of at least (+)w after two hours is taken as its titre, the fact that the dilution of the serum has been doubled by the addition of an equal volume of cell suspension being neglected. Sera of which the titres are less than 64 are not used. It should be noted that the titre of a serum varies quite markedly with the method of titration used. The cell suspensions used for titrating our α and β sera are in both cases always obtained from one of two donors of each type in this laboratory.

ANTI-M AND ANTI-N

For the preparation of these sera, rabbits are injected with cells of the types OM and ON respectively, bled into 3.8 per cent. sodium citrate solution. A course consists of the injection of suspensions containing the washed red cells from 1 c.cm. portions of blood on five successive days; sufficient cells for one course are stored in the refrigerator. Injections are made into an ear vein, except that the first dose of any further course is given intraperitoneally, as suggested by Wiener, Zinsher, and Selkowe (1934), in order to minimize the risk of anaphylaxis. Rabbits are bled from the marginal ear vein eight to ten days from the last injection, and the sera are treated and stored as described for α and β.

No standard treatment can be used for the preparation of specific testing fluids for the factors M and N. Each raw serum has to be investigated and methods for the production from it of reliable fluids discovered. The crude serum is titrated against cells of types A_1M and A_1N, to show the general immunizing effect of the injections. Before preparing considerable amounts of testing fluid from an untried serum, exploratory absorptions of small quantities are made. For example, 2 c.cm. portions of the following dilutions of the serum—1/10, 1/20, and 1/40—are mixed with the packed washed cells from 2 c.cm. of whole blood. After gentle shaking the mixtures are left on the bench for an hour at room temperature, then centrifuged, and the supernatant fluids removed and titrated against cells of the two homozygous types M and N, and the heterozygous type MN. Reactions, especially with anti-N sera, tend to be definitely less with the heterozygote than with the homozygote.

A consideration of the results of the titrations may suggest a mixture of cells and diluted serum likely to yield a satisfactory fluid. Our aim is the production of a fluid which, after only one treatment, does not react at all with cells of the type used for absorption; but it may be necessary to reabsorb once or even twice. To avoid possible contamination with α, cells of the types A_1M and A_1N are used for absorbing. The possibility of similar contamination with β has to be considered, but, although we have not ready access to donors of the types BM and BN, we always satisfy ourselves from their behaviour with controls, and the results obtained, that our fluids do not contain β.

It is not easy to define the minimum strength required of a testing fluid. Those which do not give a reaction of at least + under the microscope, at a dilution of 1/4, when titrated with homozygous cells of the appropriate type, are rejected. Anti-M fluids tend to be much stronger than anti-N, and we have never been able to prepare an anti-N which approaches in strength the most powerful anti-M fluid. Complete sterility in the preparation of the fluids is not attempted, and they are stored frozen solid in small portions (for example, 2.5 c.cm.). After use the residue in a tube is at once refrozen. Preservative should not be added to fluids and sera it is intended shall be frozen solid, as it may result in complete loss of strength.

Sometimes a fluid which usually gives a negative reaction with control cells will on another occasion give a small reaction with the same cells. Such variations, however, occasion no uncertainties, as three fluids are used. If the slightest doubt arises as to the correct diagnosis it can be settled by titration of these cells and control cells with further antisera, and, if necessary, by re-examination with a fresh specimen of the cells.

Bipartition of the A Factor into A_1 and A_2

For the bipartition into A_1 and A_2 we do not use an "anti-A_2" serum (anti-O), but only α_1 prepared by absorbing anti-A serum, usually undiluted, with cells of the type A_2. To produce a satisfactory α_1 fluid the anti-A (α) serum must be of good strength. Our α_1 fluids have titres of at least 8 with the A_1 cells used as standard; they are stored frozen solid. Tests with α_1 receive the third volume of saline used with α and β. As with the anti-M and anti-N fluids, an α_1 will sometimes give a slight reaction with cells of the type used for absorption, in this case A_2 cells; and although there are quite definite variations in the strengths with which different A_1 cells react with α_1, the diagnosis in cases of doubt can be settled by titration.

Thomsen (1929) and Thomsen, Friedenreich, and Worsaae (1930a) have shown that the A_1 in A_1B cells is sometimes obscured by the B factor, and Friedenreich and Zacho (1931) have suggested that, when A_2B is diagnosed, confirmation be obtained by titration of the cells with unabsorbed α, with which the reactions of true A_2B cells are always markedly weaker than those of A_1B and A_2 cells (Taylor and Prior, 1938a, p. 349).

On Some Technical Points

The commonest source of error in determining the groups of the ABO system is the use of testing sera which are too weak; the A factor in A_2B cases is particularly liable to be missed, the B factor alone being recorded. Only a small proportion of persons of the groups A and B yield satisfactory β and α, and sera should be titrated before use; it should be remembered that they tend to weaken with age, sometimes with surprising rapidity. Probably the best way of storing α and β is frozen solid. False positive reactions, due to rouleaux formation, may be recorded, particularly with a slide technique. The reactions of the sera with well-known control cells should prevent most errors.

In this laboratory the diagnosis of the factors M and N has been found difficult and troublesome, and it was only after a great deal of preliminary work that satisfactory results were obtained; those for the first twelve months had to be discarded.

Authorities are agreed that the diagnosis of these factors is far from easy, and that reliable results can only be expected from workers with considerable experience. In the Galton Laboratory, where on almost every working day M and N tests are performed, the most unremitting care and attention is necessary to ensure that there is always available a supply of reliable reagents, and the same is true of Scandinavian laboratories visited by one of us (G. L. T.).

Causes of Erroneous Diagnosis

Errors in diagnosis may be caused by false positive or false negative reactions.

False positive reactions are due to the presence in the testing fluid of a contaminating unwanted agglutinin, which may be α, β, possibly anti-O, some unknown and uncharted antibody, or species-specific antibody due to under-absorption. Both α and β may occur naturally in the uninjected rabbit, and although only cells of the type O

are injected for the production of anti-M and anti-N sera, considerable amounts of α, and occasionally of β, may be present in the immune serum. Any contamination by the known agglutinins should be disclosed by the reactions of a serum with control cells from persons whose blood groups are well known. Absorption with appropriate cells containing the corresponding antigen is necessary to remove the unwanted antibody. Contamination of a serum with an antibody other than those of the ABO and M–N systems must be rare, and the possibility of error remote if three fluids from different rabbits are used, for it is most unlikely that the contaminant would be present in all three. Danger from under-absorption is very real, for an absorbed fluid which no longer gives any reaction with the absorbing cells may give a small but definite reaction with certain other cells of the same group in the M–N system, and if such a fluid is the only one in use it may be impossible to interpret properly a small reaction, and a homozygote may be recorded as a heterozygote. An obvious remedy would seem to be further absorption, but very often, and particularly in the case of anti-N sera, this results in a testing fluid which is too weak, non-specific absorption having removed much of the antibody it is desired to retain.

False negative reactions are due to the use of testing fluids which are too weak, owing to their having been over-absorbed, or to their having lost strength during storage, or because it is impossible to prepare strong fluids from the sera used. Loss of sensitivity of the cells may also contribute to false negative results. The greatest difficulty met with in our work with the M–N system has been the avoidance of over-absorption of testing fluids, for not only do absorbing cells remove, specifically, unwanted antibodies, but they also, by non-specific absorption, take out some of the antibody it is desired to keep. Whilst non-specific absorption occurs with anti-M sera, it is much more marked and causes much more trouble with anti-N sera. Given an unabsorbed serum containing anti-M in good strength, we are able to prepare, with comparative ease, strong and satisfactory testing fluid. Far more troublesome is the preparation of good anti-N fluids, non-specific over-absorption with loss of strength being so difficult to avoid. Usually it is only after many trial absorptions with varying dilutions of serum and varying amounts of cells that a satisfactory prescription is found for an anti-N fluid, and a prescription which works well on one occasion is not always equally successful when repeated. Very often, after one absorption, an anti-N fluid is obtained which in titration reacts well with N cells, but also gives a small reaction with M cells. If the M reaction is not too big it is frequently better to avoid it by suitable dilution of the testing fluid, rather than risk weakening the anti-N by further absorption; often a small reaction with M cells will disappear after the fluid has been stored for a few days. It has already been said that anti-N fluids are more troublesome to prepare than anti-M fluids; they are also much more liable to decrease in strength, and unless they are stored frozen solid, anti-N fluids tend to lose much of their strength in a few days, even at refrigerator temperatures just above freezing-point. Frozen solid they weaken much more gradually.

Most of the rabbits injected in this laboratory have not yielded antisera from which we have been able to make good testing fluids, even after five or six courses of injections. It has been stated that about one rabbit in five yields a serum from which a satisfactory anti-M fluid can be made, and that from such a serum the preparation is not very difficult; our experience confirms this. It is also said that from nearly every rabbit it is possible to get a serum from which satisfactory anti-N fluid can be made, but the making of it tends to be by no means so easy. With the first part of this latter statement our experience is not in agreement: the sera from about a quarter only of our anti-N rabbits have been good. Of the difficulty met with in the preparation of anti-N fluid there can be no doubt.

Freshly shed cells tend to react better than older ones, and there is a definite loss of sensitivity with storage, which is less at low temperatures. The reactions of cells bled twenty-four or thirty-six hours and sent through the post are markedly weaker than those of cells recently shed, and even of cells of the same age stored in the refrigerator. The combination of a not very strong testing fluid and cells which have lost in sensitivity may lead to a reaction which is only slight, and a doubt as to its being negative or positive: when three sera are used results should give no cause for doubt.

We regard as one of the most important factors contributing to the successful diagnosis of the M–N groups a day-to-day familiarity with the actual reagents used. As it is much diluted before absorption, a supply of 20 to 25 c.cm. of raw serum permits of many batches of testing fluid being prepared and of a very large number of tests being performed with it. Thus a good serum serves for many months, and the worker becomes familiar with its characters and peculiarities, for sera differ much as regards the treatment needed to yield good testing fluid, and as regards the keeping properties and strength of fluids obtainable therefrom. If the testing fluids used are shown to be reliable by their correct behaviour on many occasions with well-known control cells, and by a statistical analysis of a goodly number of results yielded by them, and if new sera are tried out alongside those whose behaviour is well understood, a constant supply of well-tested and dependable sera should be obtained and correct diagnoses ensured.

The χ^2 Test

The agreement between the numbers of a random population observed and the numbers expected, according to the genetic theory of Landsteiner and Levine (1928), in each of the three M–N groups, can be readily tested for significance by means of the well-known χ^2 test (see Taylor and Prior, 1938b). If, of those examined, a, b, and c are the numbers observed in the groups M, MN, and N respectively, then it can be shown that

$$\chi^2 = \frac{(b^2-4ac)^2(a+b+c)}{(2a+b)^2(b+2c)^2},$$

there is but one degree of freedom. The value of χ^2 is a measure of how much the observed results differ from those expected, and can be used to indicate the probability of those differences being due to chance. Fisher (1938) has constructed tables of χ^2 values corresponding to various levels of probability and different numbers of degrees of freedom. By calculating the χ^2 value for a batch of M–N results, and by consulting the tables, the limits between which the probability of the observed result lies can be seen at once. The value of χ^2, for one degree of freedom, corresponding to a probability of 0.05, the level usually taken as significant, is 3.841, and values greater than this are suggestive of errors in diagnosis. A beginner with the M–N system would do well, before resting satisfied with his technique and reagents, to submit a good number of his results, say 300 or more, to a statistical analysis such as that described below for the 1,073 cases we are here reporting.

The presence of contaminating agglutinins is likely to lead to homozygotes being mistaken for heterozygotes and a consequent excess of this latter type, while weak testing fluids will have the opposite effect—too few heterozygotes. Both sources of error may be present at the same time, their effects on the resulting data cancelling each other, so that what at first sight appear reasonable figures for the M–N groups may be obtained. Contamination of sera by the agglutinins of the ABO system should be disclosed by examining the frequencies of the M–N groups in the various groups of the ABO system; the presence of α, for example, in testing fluids for M and N would lead to a marked excess of the type AMN. In Table II are the

TABLE II

ABO Groups Number and Percentage	Number and Percentage in Groups of MN System			χ^2	Probability
	M	MN	N		
O, 493 (45.946)	150 (30.426)	233 (47.262)	110 (22.312)	1.160	>0.20
A, 451 (42.032)	128 (28.381)	230 (50.998)	93 (20.621)	0.308	>0.50
B, 100 (9.320)	32 (32.000)	47 (47.000)	21 (21.000)	0.235	>0.50
AB, 29 (2.703)	9 (31.034)	16 (55.172)	4 (13.793)	0.546	>0.30
Total .. 1,073*	319 (29.730)	526 (49.021)	228 (21.249)	0.167	>0.50

* Includes 422 already published by Taylor and Prior (loc. cit.).

details of such an analysis of our 1,073 cases. The probabilities given were obtained from Fisher's χ^2 tables previously mentioned. It is seen that the figures for the M–N groups as a whole, and in regard to the groups of the ABO system, are in excellent agreement with the expectations. That the heterozygotes, MN, are only in excess in the two groups containing the factor A might suggest contamination of testing fluids with α; a statistical test, however, with a χ^2 value of 1.726 for one degree of freedom, shows that the excess is not significant.

In the ABO and the extended A_1, A_2, B, O systems the agreement between results observed and expected, according to accepted genetic theory, can be examined as described by Taylor and Prior (1938b), and by Stevens (1938). That the 1,073 ABO results agree with the triple allelomorph theory of inheritance advanced by Bernstein (1924, 1925) is shown by a test giving a χ^2 value of 1.168 for one degree of freedom, which corresponds to a probability greater than 0.20. Only 996 of the 1,073 samples were tested during the time partition of the factor A into A_1 and A_2 was performed as a routine measure, the distribution among the six phenotypes being:

O	A_1	A_2	B	A_1B	A_2B
451	346	76	94	22	7

Agreement with the four-gene theory of Thomsen, Friedenreich, and Worsaae (1930b, 1930c), an extension of Bernstein's theory embracing the factors A_1, A_2, is demonstrated by a χ^2 value of 0.9311 for two degrees of freedom, indicating a probability greater than 0.50.

Summary

The technique for the diagnosis of the factors A_1, A_2, B, O, M, and N, used by a unit constantly engaged in work on blood groups, is described, and difficulties discussed.

The results of tests on the blood cells of 1,073 people in England are given, and shown by statistical analysis to be in agreement with genetic theory.

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Clinical Memoranda

Fatal Agranulocytosis after Sulphanilamide Treatment

The following case of fatal agranulocytosis occurring after a course of prontosil treatment is of interest because of the comparatively low dosage of the drug given and the fulminating nature of the final illness.

CASE RECORD

The patient, an obese married woman of 60, was receiving treatment from her doctor for recurrent frontal sinusitis, and prontosil administration had been started for this condition on July 25, 1938, the dose being 3 half-gramme tablets of prontosil album (*p*-aminophenylsulphonamide) daily. This was continued until August 18, when the drug was stopped owing to increased headache; aspirin, 10 grains thrice daily, was substituted. On August 24 she became acutely ill, with sore throat, headache, and rigors, and there was an increase of the purulent nasal discharge. On August 27 examination revealed severe inflammation of the fauces, pharynx, and nasal mucosa, with oedema and deep necrosis. The cervical glands were enlarged, and, with extensive periadenitis, presented a "bull-necked" appearance. The tongue was dry and covered with sordes. Circulatory collapse was marked, with slaty pallor and a thin running pulse.

A throat swab showed *Streptococcus viridans* and *Staphylococcus aureus* on culture, no diphtheria bacilli being seen, and the blood count gave the following result: red cells, 3,580,000 per c.mm.; haemoglobin, 56 per cent.; white cells, 600 per c.mm.—polymorphs 2 per cent., lymphocytes 94 per cent., monocytes 4 per cent. A transfusion of 300 c.cm. of citrated blood was given from a donor suffering from myeloid leukaemia whose total white cell count was 120,000 per c.mm., but the patient never rallied, and she died early the next morning.

A post-mortem examination was made by Dr. T. Skene Keith, who reports as follows.

"Mouth edentulous. Oedema and ulceration of gums and of pharynx; the posterior nasopharynx blocked by oedematous mucous membrane. Larynx and trachea not ulcerated, but full of blood-tinged sputum. The pleural cavities contain a few old adhesions. Both lungs show a medium degree of bronchopneumonia. The heart and other viscera are normal. A film from the sternal bone marrow reveals many mononuclear cells, but no polymorphonuclear leucocytes. Immature and developing erythrocytes found. Cause of death, agranulocytosis."

COMMENTARY

In view of similar cases that have been reported it is reasonable to assume that the agranulocytosis in this instance is attributable to the occasional depressant action of the sulphanilamide group of drugs on the leucopoietic

system. The dose, 34.5 grammes in twenty-three days, is, however, low in comparison with the average figure of 58 grammes taken from seven fatal cases quoted by Johnston (1938). The suggestion that the duration of the treatment is of greater importance than the total dosage is supported by the figures in this case, and it is noteworthy that in Johnston's series of fatal cases the minimum duration of treatment was 17 days and the average 23.6 days. The cumulative nature of this action is emphasized by the latent period of six days that elapsed between omission of the drug and the appearance of warning symptoms.

My thanks are due to Sir Frederick Menzies and to Mr. J. R. M. Whigham, medical superintendent of St. Andrew's Hospital, for their kind permission to publish this case.

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Ulcerative Tonsillitis with Blood Count simulating Lymphoid Leukaemia

Recovery from a sloughing tonsillitis and pharyngitis with a white-cell count of over 60 per cent. lymphocytes must be sufficiently rare to justify placing on record.

CASE RECORD

The patient was a single woman aged 25, of normal build, pale, but never having suffered from any serious illness. On March 15, 1938, she complained of a chain of glands in the neck, in front of the left sterno-mastoid. During the next two days there was malaise and the throat became red and sore. On March 18 the temperature was 101.8° F. The next day the patient was first examined; her temperature was then 102° F., and pulse 100; the throat showed a typical membranous type of tonsillitis. Numerous glands were present on both sides of the neck. Her general condition was good. The heart, lungs, and abdomen showed no abnormal physical signs. She was given an antiseptic mouthwash and a mixture containing potassium chlorate and sodium salicylate. A swab of the throat was taken; this proved negative for diphtheria. During the next three days the condition remained much the same, the temperature rising to about 103° F. each day and the throat becoming cleaner but rather more swollen.

On the 23rd, as there was not much improvement in the general condition, 5 c.cm. of 5 per cent. prontosil soluble was given intramuscularly and 1 gramme of prontosil album thrice daily by mouth. The next day the general condition started to deteriorate: the temperature was 103.5° F., the pulse 110, and weakness was increasing. The surface of the tonsils and adjoining pharynx was beginning to become covered by ulcerating sloughs and was very much swollen. Difficulty began to be experienced in swallowing and also in breathing through the nose. The glands in the neck had increased in number and size. Another throat swab proved negative for Vincent's angina, but numerous short-chain streptococci were present. During the next two days her condition deteriorated steadily. On the 26th the ulcerating sloughs in the throat were very extensive and were growing deeper. The temperature was up to 105° F., and there was mild delirium at night. An arsenic-containing throat paint was tried, and 0.3 gramme of N.A.B. was given intravenously. On the 27th there was no improvement. She was very weak, her temperature being 103° F. and pulse 120, and she was able to swallow very little fluid. The spleen was palpable and soft, about two fingers below the costal margin on deep breathing.

On the 28th the patient appeared to be sinking; her temperature was 102° F. and pulse 120 and irregular. Prontosil soluble was given, 5 c.cm. intramuscularly morning and evening, as well as 1 gramme of prontosil album thrice daily by mouth. A blood count showed the following: haemoglobin, 95 per cent.; red cells, 4,000,000 per c.mm.; white cells, 16,800 per c.mm. *Differential count:* polymorphs, 35 per cent.; lymphocytes, 62 per cent. (many were large); and monocytes, 3 per cent. Rectal salines were given four-hourly, and the throat irrigated four-hourly with Milton and water. During the 29th and 30th the same treatment was given, and by the 30th there was slight improvement in the patient's general condition; the temperature began to fall, not rising above 100° F. at night, and the pulse was stronger, but was still 120. The throat by this time was slightly cleaner; the ulcers were no longer spreading, and more fluid could be swallowed. On March 31 the temperature was approximately normal. Prontosil soluble was given once daily for the next three days and then discontinued, but 1 gramme of prontosil album, thrice daily, was continued by mouth. During the next week steady uninterrupted progress was made, the throat gradually becoming cleaner and the patient stronger. The prontosil was discontinued on April 7. Convalescence was uninterrupted. Twelve injections of campolon were given, starting on April 14. Iron and ammonium citrate, 20 grains, was also given thrice daily.

Blood counts were taken on several occasions, being as follows:

April 2.—Red cells, 3,840,000 per c.mm.; white cells, 7,000 only. *Differential count:* polymorphs, 29 per cent.; lymphocytes, 36 per cent.; immature cells, 33 per cent.: these cells more resemble a premyelocyte than a large lymphocyte. The condition suggests a leukaemia in an aleukaemic phase.

April 11.—Haemoglobin, 55 per cent.; red cells, 3,360,000 per c.mm.; white cells, 11,200 per c.mm. *Differential count:* polymorphs, 47 per cent.; lymphocytes, 34 per cent.; large cells (? premyelocytes; ? large lymphocytes), 24 per cent. The white cells appear to be improving—that is, there is a greater proportion of polymorphs—but a very definite cell and colour anaemia now shows.

May 3.—Haemoglobin, 80 per cent.; red cells, 4,190,000 per c.mm.; white cells, 7,500 per c.mm. *Differential count:* polymorphs, 57 per cent.; small lymphocytes, 35 per cent.; large lymphocytes, 2 per cent.; hyalines, 2 per cent.; eosinophils, 3 per cent.; masts, 1 per cent.

June 14.—Haemoglobin, 75 per cent.; red cells, 4,300,000 per c.mm.; white cells, 10,000 per c.mm. *Differential count:* polymorphs, 50 per cent.; lymphocytes, 46 per cent.; hyalines, 4 per cent. This count is approximately normal except for secondary anaemia.

August 18.—Haemoglobin, 75 per cent.; red cells, 4,290,000 per c.mm.; white cells, 8,000 per c.mm. *Differential count:* polymorphs, 53 per cent.; small lymphocytes, 37 per cent.; large lymphocytes, 2 per cent.; eosinophils, 4 per cent.; large mononuclears, 5 per cent. This is a normal count except for slight secondary anaemia.

COMMENTARY

The unusual blood count in this case was at first taken to indicate the presence of an early stage of lymphoid leukaemia. The possibility of a typical agranulocytic leukaemia was entertained. In view of the further history of the case the condition would appear to have been neither of these, but an unusual response to a virulent streptococcal infection.

Whether prontosil had any effect on this blood count it is difficult to say. The initial dosage of prontosil would appear to have been too small, as improvement occurred very shortly after the dosage was increased.

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Reviews

PHYSICAL EXAMINATION OF THE CHEST

Diseases of the Chest and the Principles of Physical Diagnosis. By George W. Norris, A.B., M.D., and H. R. M. Landis, A.M., M.D., Sc.D. Sixth edition. (Pp. 1,019; 478 figures, some of which are coloured. 45s. net.) London: W. B. Saunders. 1938.

In recent years physicians have stressed the importance of radiological examination in the diagnosis of pulmonary tuberculosis and the fallacy of relying on stethoscopic signs to exclude a tuberculous lesion or estimate its activity. Unfortunately this correct and restricted view is interpreted by other practitioners as showing that the chest specialist ignores physical examination altogether in favour of radiography. If there is such a tendency among some physicians it is due not a little to the hurried manner in which patients must be examined in crowded clinics. The experienced physician still regards physical examination, of which auscultation forms only one component, as of the utmost importance in the differential diagnosis of symptoms referable to the chest. To carry out physical examinations quickly and to advantage, however, requires a sound and prolonged training. We know of no better book for this purpose than Norris and Landis's *Diseases of the Chest and the Principles of Physical Diagnosis,* of which a new edition, the sixth, has now been published. Owing to the death of Dr. Landis his part of the revision has been carried out by Dr. Simon S. Leopold. Extensive changes have been carried out in this edition. The sections dealing with bronchial asthma, bronchiectasis, lung abscess, and cystic disease, and the relations of nasal and accessory sinus disease to infections of the lower respiratory tract have been completely rewritten. Similarly, in the cardiological part, the chapter on coronary disease has been completely rewritten and that on hypertensive disease extensively revised; and several chapters have been written by Dr. Thomas M. McMillan, notably on the electrocardiograph, cardiac arrhythmias, and *x*-ray diagnosis of diseases of the heart and great vessels.

The book is divided into four parts: examination of the lungs; examination of the circulatory system; diseases of the bronchi, lungs, pleura, and diaphragm; and diseases of the heart. It is to the first two parts of the book that special attention should be drawn; to them the individuality of the book is due and in them its best features are seen. The textual matter is clear, succinct, and to the point. The numerous illustrations are excellent and all helpful. Many are photographs of frozen sections from the cadaver, previously hardened in formalin, so that the anatomical relations of the tissues remain as during life. It is disappointing, however, not to find a chapter on radiological examination of the lungs, and indeed scanty use is made of skiagrams in describing pulmonary diseases later. Admittedly the aim of the authors has been "to prepare a practical book on diagnosis in which clinical methods of examination are emphasized," but this has not prevented the inclusion of an excellent chapter on radiological examination of the heart and great vessels, and moreover radiography of the chest should surely now be included in "clinical" examination. Such an omission cannot be justified on the ground that "the ordinary methods of diagnosis are far superior to the *x*-ray in cases of incipient or early pulmonary tuberculosis and in congestion of the lungs unless the radiography is done by an expert who is skilled not only in the taking and reading of the films, but who, in addition, has a thorough knowledge of the pathology of tuberculosis"—a statement that appears to be contradicted later in the book by (this time) Dr. Leopold, who comments that "in certain phases of tuberculosis it must be realized that the *x*-rays and the *x*-rays alone will furnish the necessary information." On the other hand, in the cardiological section the importance of *x*-ray examination is stressed—"in some instances the *x*-ray findings supersede in value all other clinical findings"—but the history, and particularly the answer to the question "What can you do?" is rightly considered as far more important than the physical examination.

There is little to criticize in the last two parts of the book, in which are discussed seriatim the various diseases of the lungs and heart. The views expressed are on the whole strictly up to date, though we find the morbid anatomy of pulmonary tuberculosis sketched on the basis of quotations from old authors rather than on more recent work of German and French schools. The morbid anatomical illustrations in both the sections on the lungs and those on the heart are excellent, and on debatable topics the opinions expressed are generally sound and unbiased. The book can therefore be thoroughly recommended to the student, and indeed to the physician also, who will benefit by refreshing his memory with the minutiae and rationale of physical examination. The student intent on mastering all details in the book may, however, find that in acquiring knowledge of all the trees he has lost a view of the wood.

MEDICAL ENTOMOLOGY

Medical Entomology. A Survey of Insects and Allied Forms which Affect the Health of Man and Animals. By William A. Riley, Ph.D., Sc.D., and Oscar A. Johannsen, Ph.D. Second edition. (Pp. 483; 184 figures. 25s.) London: McGraw-Hill Publishing Company. 1938.

This is a second edition of their well-known book by the American authors Riley and Johannsen of Minnesota and Cornell Universities. It follows the pattern set by the first. In the preface to the first edition the authors stated their belief that "he who knows the history of the development of his chosen field of work is thereby better fitted to evaluate its present status and to appreciate its future possibilities." They have therefore directed attention to the work of the pioneers as well as to that of the modern scientists.

In the six years which have passed since the publication of the first edition new data have accumulated which have called for slight alterations or additions to the text. The new matter is generally referred to very briefly and is so inserted that the original paging remains undisturbed. These additions include a fuller account of the "black widow" spider, *Latrodectes mactans*; comments on the reports of the Indian Kala-azar Commission, 1933 and 1936; mention of the role of fleas in the transmission of endemic typhus, and a very short reference to jungle yellow fever. The accounts of the screw-worm, larva of *Cochliomyia hominovorax,* found in the flesh of man and animals, and the paragraph on the treatment of osteomyelitis by the utilization of maggots of *Lucilia* include references to more modern work. Systematics are largely confined to the keys to the identification of the various forms, so that the text is not overburdened with taxonomic detail. Entomologists may think that the opportunity ought to have been taken to correct the spelling of some of the names (for example, *Phthirus* is the name of the crab louse, not *Phthirius*) and to bring others up to date (for example, the rat flea is now *Nosopsyllus,* not *Cerato-*

system. The dose, 34.5 grammes in twenty-three days, is, however, low in comparison with the average figure of 58 grammes taken from seven fatal cases quoted by Johnston (1938). The suggestion that the duration of the treatment is of greater importance than the total dosage is supported by the figures in this case, and it is noteworthy that in Johnston's series of fatal cases the minimum duration of treatment was 17 days and the average 23.6 days. The cumulative nature of this action is emphasized by the latent period of six days that elapsed between omission of the drug and the appearance of warning symptoms.

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The patient was a single woman aged 25, of normal build, pale, but never having suffered from any serious illness. On March 15, 1938, she complained of a chain of glands in the neck, in front of the left sterno-mastoid. During the next two days there was malaise and the throat became red and sore. On March 18 the temperature was 101.8° F. The next day the patient was first examined; her temperature was then 102° F., and pulse 100; the throat showed a typical membranous type of tonsillitis. Numerous glands were present on both sides of the neck. Her general condition was good. The heart, lungs, and abdomen showed no abnormal physical signs. She was given an antiseptic mouthwash and a mixture containing potassium chlorate and sodium salicylate. A swab of the throat was taken; this proved negative for diphtheria. During the next three days the condition remained much the same, the temperature rising to about 103° F. each day and the throat becoming cleaner but rather more swollen.

On the 23rd, as there was not much improvement in the general condition, 5 c.cm. of 5 per cent. prontosil soluble was given intramuscularly and 1 gramme of prontosil album thrice daily by mouth. The next day the general condition started to deteriorate: the temperature was 103.5° F., the pulse 110, and weakness was increasing. The surface of the tonsils and adjoining pharynx was beginning to become covered by ulcerating sloughs and was very much swollen. Difficulty began to be experienced in swallowing and also in breathing through the nose. The glands in the neck had increased in number and size. Another throat swab proved negative for Vincent's angina, but numerous short-chain streptococci were present. During the next two days her condition deteriorated steadily. On the 26th the ulcerating sloughs in the throat were very extensive and were growing deeper. The temperature was up to 105° F., and there was mild delirium at night. An arsenic-containing throat paint was tried, and 0.3 gramme of N.A.B. was given intravenously. On the 27th there was no improvement. She was very weak, her temperature being 103° F. and pulse 120, and she was able to swallow very little fluid. The spleen was palpable and soft, about two fingers below the costal margin on deep breathing.

On the 28th the patient appeared to be sinking; her temperature was 102° F. and pulse 120 and irregular. Prontosil soluble was given, 5 c.cm. intramuscularly morning and evening, as well as 1 gramme of prontosil album thrice daily by mouth. A blood count showed the following: haemoglobin, 95 per cent.; red cells, 4,000,000 per c.mm.; white cells, 16,800 per c.mm. *Differential count:* polymorphs, 35 per cent.; lymphocytes, 62 per cent. (many were large); and monocytes, 3 per cent. Rectal salines were given four-hourly, and the throat irrigated four-hourly with Milton and water. During the 29th and 30th the same treatment was given, and by the 30th there was slight improvement in the patient's general condition; the temperature began to fall, not rising above 100° F. at night, and the pulse was stronger, but was still 120. The throat by this time was slightly cleaner; the ulcers were no longer spreading, and more fluid could be swallowed. On March 31 the temperature was approximately normal. Prontosil soluble was given once daily for the next three days and then discontinued, but 1 gramme of prontosil album, thrice daily, was continued by mouth. During the next week steady uninterrupted progress was made, the throat gradually becoming cleaner and the patient stronger. The prontosil was discontinued on April 7. Convalescence was uninterrupted. Twelve injections of campolon were given, starting on April 14. Iron and ammonium citrate, 20 grains, was also given thrice daily.

Blood counts were taken on several occasions, being as follows:

April 2.—Red cells, 3,840,000 per c.mm.; white cells, 7,000 only. *Differential count:* polymorphs, 29 per cent.; lymphocytes, 36 per cent.; immature cells, 33 per cent.: these cells more resemble a premyelocyte than a large lymphocyte. The condition suggests a leukaemia in an aleukaemic phase.

April 11.—Haemoglobin, 55 per cent.; red cells, 3,360,000 per c.mm.; white cells, 11,200 per c.mm. *Differential count:* polymorphs, 47 per cent.; lymphocytes, 34 per cent.; large cells (? premyelocytes; ? large lymphocytes), 24 per cent. The white cells appear to be improving—that is, there is a greater proportion of polymorphs—but a very definite cell and colour anaemia now shows.

May 3.—Haemoglobin, 80 per cent.; red cells, 4,190,000 per c.mm.; white cells, 7,500 per c.mm. *Differential count:* polymorphs, 57 per cent.; small lymphocytes, 35 per cent.; large lymphocytes, 2 per cent.; hyalines, 2 per cent.; eosinophils, 3 per cent.; masts, 1 per cent.

June 14.—Haemoglobin, 75 per cent.; red cells, 4,300,000 per c.mm.; white cells, 10,000 per c.mm. *Differential count:* polymorphs, 50 per cent.; lymphocytes, 46 per cent.; hyalines, 4 per cent. This count is approximately normal except for secondary anaemia.

August 18.—Haemoglobin, 75 per cent.; red cells, 4,290,000 per c.mm.; white cells, 8,000 per c.mm. *Differential count:* polymorphs, 53 per cent.; small lymphocytes, 37 per cent.; large lymphocytes, 2 per cent.; eosinophils, 4 per cent.; large mononuclears, 5 per cent. This is a normal count except for slight secondary anaemia.

COMMENTARY

The unusual blood count in this case was at first taken to indicate the presence of an early stage of lymphoid leukaemia. The possibility of a typical agranulocytic leukaemia was entertained. In view of the further history of the case the condition would appear to have been neither of these, but an unusual response to a virulent streptococcal infection.

Whether prontosil had any effect on this blood count it is difficult to say. The initial dosage of prontosil would appear to have been too small, as improvement occurred very shortly after the dosage was increased.

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Reviews

PHYSICAL EXAMINATION OF THE CHEST

Diseases of the Chest and the Principles of Physical Diagnosis. By George W. Norris, A.B., M.D., and H. R. M. Landis, A.M., M.D., Sc.D. Sixth edition. (Pp. 1,019; 478 figures, some of which are coloured. 45s. net.) London: W. B. Saunders. 1938.

In recent years physicians have stressed the importance of radiological examination in the diagnosis of pulmonary tuberculosis and the fallacy of relying on stethoscopic signs to exclude a tuberculous lesion or estimate its activity. Unfortunately this correct and restricted view is interpreted by other practitioners as showing that the chest specialist ignores physical examination altogether in favour of radiography. If there is such a tendency among some physicians it is due not a little to the hurried manner in which patients must be examined in crowded clinics. The experienced physician still regards physical examination, of which auscultation forms only one component, as of the utmost importance in the differential diagnosis of symptoms referable to the chest. To carry out physical examinations quickly and to advantage, however, requires a sound and prolonged training. We know of no better book for this purpose than Norris and Landis's *Diseases of the Chest and the Principles of Physical Diagnosis*, of which a new edition, the sixth, has now been published. Owing to the death of Dr. Landis his part of the revision has been carried out by Dr. Simon S. Leopold. Extensive changes have been carried out in this edition. The sections dealing with bronchial asthma, bronchiectasis, lung abscess, and cystic disease, and the relations of nasal and accessory sinus disease to infections of the lower respiratory tract have been completely rewritten. Similarly, in the cardiological part, the chapter on coronary disease has been completely rewritten and that on hypertensive disease extensively revised; and several chapters have been written by Dr. Thomas M. McMillan, notably on the electrocardiograph, cardiac arrhythmias, and *x*-ray diagnosis of diseases of the heart and great vessels.

The book is divided into four parts: examination of the lungs; examination of the circulatory system; diseases of the bronchi, lungs, pleura, and diaphragm; and diseases of the heart. It is to the first two parts of the book that special attention should be drawn; to them the individuality of the book is due and in them its best features are seen. The textual matter is clear, succinct, and to the point. The numerous illustrations are excellent and all helpful. Many are photographs of frozen sections from the cadaver, previously hardened in formalin, so that the anatomical relations of the tissues remain as during life. It is disappointing, however, not to find a chapter on radiological examination of the lungs, and indeed scanty use is made of skiagrams in describing pulmonary diseases later. Admittedly the aim of the authors has been "to prepare a practical book on diagnosis in which clinical methods of examination are emphasized," but this has not prevented the inclusion of an excellent chapter on radiological examination of the heart and great vessels, and moreover radiography of the chest should surely now be included in "clinical" examination. Such an omission cannot be justified on the ground that "the ordinary methods of diagnosis are far superior to the *x*-ray in cases of incipient or early pulmonary tuberculosis and in congestion of the lungs unless the radiography is done by an expert who is skilled not only in the taking and reading of the films, but who, in addition, has a thorough knowledge of the pathology of tuberculosis"—a statement that appears to be contradicted later in the book by (this time) Dr. Leopold, who comments that "in certain phases of tuberculosis it must be realized that the *x*-rays and the *x*-rays alone will furnish the necessary information." On the other hand, in the cardiological section the importance of *x*-ray examination is stressed—"in some instances the *x*-ray findings supersede in value all other clinical findings"—but the history, and particularly the answer to the question "What can you do?" is rightly considered as far more important than the physical examination.

There is little to criticize in the last two parts of the book, in which are discussed seriatim the various diseases of the lungs and heart. The views expressed are on the whole strictly up to date, though we find the morbid anatomy of pulmonary tuberculosis sketched on the basis of quotations from old authors rather than on more recent work of German and French schools. The morbid anatomical illustrations in both the sections on the lungs and those on the heart are excellent, and on debatable topics the opinions expressed are generally sound and unbiased. The book can therefore be thoroughly recommended to the student, and indeed to the physician also, who will benefit by refreshing his memory with the minutiae and rationale of physical examination. The student intent on mastering all details in the book may, however, find that in acquiring knowledge of all the trees he has lost a view of the wood.

MEDICAL ENTOMOLOGY

Medical Entomology. A Survey of Insects and Allied Forms which Affect the Health of Man and Animals. By William A. Riley, Ph.D., Sc.D., and Oscar A. Johannsen, Ph.D. Second edition. (Pp. 483; 184 figures. 25s.) London: McGraw-Hill Publishing Company. 1938.

This is a second edition of their well-known book by the American authors Riley and Johannsen of Minnesota and Cornell Universities. It follows the pattern set by the first. In the preface to the first edition the authors stated their belief that "he who knows the history of the development of his chosen field of work is thereby better fitted to evaluate its present status and to appreciate its future possibilities." They have therefore directed attention to the work of the pioneers as well as to that of the modern scientists.

In the six years which have passed since the publication of the first edition new data have accumulated which have called for slight alterations or additions to the text. The new matter is generally referred to very briefly and is so inserted that the original paging remains undisturbed. These additions include a fuller account of the "black widow" spider, *Latrodectes mactans*; comments on the reports of the Indian Kala-azar Commission, 1933 and 1936; mention of the role of fleas in the transmission of endemic typhus, and a very short reference to jungle yellow fever. The accounts of the screw-worm, larva of *Cochliomyia hominovorax*, found in the flesh of man and animals, and the paragraph on the treatment of osteomyelitis by the utilization of maggots of *Lucilia* include references to more modern work. Systematics are largely confined to the keys to the identification of the various forms, so that the text is not overburdened with taxonomic detail. Entomologists may think that the opportunity ought to have been taken to correct the spelling of some of the names (for example, *Phthirus* is the name of the crab louse, not *Phthirius*) and to bring others up to date (for example, the rat flea is now *Nosopsyllus*, not *Cerato-*

phyllus). However, the emphasis is on the medical, experimental, and biological aspects of the subject, and the work includes accounts of modern methods of control. It is not simply a textbook for medical entomologists but is a readable, compact, world-wide survey which will continue to be read and used by medical officers, teachers, and students. The extensive bibliography is now supplemented by another hundred or so references, mainly to recent work. The two dates 1832 and 1827 on page 460 are obvious misprints for 1932 and 1927.

PLAY THERAPY

Play Therapy in Childhood. By C. H. Rogerson, M.D., M.R.C.P., D.P.M. (Pp. 64. 3s. 6d. net.) London: Oxford University Press. 1939.

In a monograph with this title it would have been pleasant to have a more comprehensive outline of the subject. Dr. Rogerson gives a historical survey of the pioneer work of Freud and his followers in child psycho-analysis and refers to the methods of various American psychiatrists, but except for his own psychiatric use of children's play the author gives no account of the wide development of play therapy in this country. A detailed study of four cases is put forward, with clinical descriptions containing much interesting material, especially with regard to the fantasy life of childhood. The technique used is described as "essentially non-interpretative in the Freudian sense, though it involves the discussion of play situations with the child." An example of such discussions is quoted in which it was suggested to the patient that in writing "Silly C. H. Rogerson, pooh!" she was a bad little girl, but that she was good when she addressed the psychiatrist with respect—an explanation surely typical rather of the Fairchild Family than of play therapy in general.

THE STERIDS

The Chemistry of the Sterids. By Harry Sobotka. (Pp. 634; 24 tables, 4 figures. 38s.) London: Baillière, Tindall and Cox. 1938.

Mr. Harry Sobotka's book contains as its principal feature a classified catalogue of the substances which have come to be known by the name "sterids" and of prepared derivatives from them. This group of substances comprises a large number having a very diversified distribution and origin. They include the bile acids, the cholesterol of the brain, the ergosterol of yeast, which occurs also in other fungoid vegetation, the toad poisons, and the sex hormones. To this group are related the cardiac glycosides and antirachitic vitamins, while some carcinogenetic substances have been found to have a kindred or related chemical structure. Some nine of the opening chapters are devoted to an account of the chemical reactions in which these substances are capable of engaging, to the methods by which derivatives have been obtained, and to their physical properties. Apart from the fact that knowledge of the known members of this series has been hitherto somewhat scattered, their numbers due to new syntheses have in recent years increased more than tenfold. The interrelationship of their chemical structure cannot fail to be of the highest importance, more particularly in regard to their physiological action and their biological functions. The preface to the volume expresses the hope that the classified catalogue will form a useful up-to-date supplement to Beilstein's *Handbook of Organic Chemistry*. This expression is descriptive of the nature and scope of the treatment given, and it is as exhaustive as could be desired. There is no doubt that the volume, which we believe to be the first of its kind, will be of great value in co-ordinating the existing knowledge of these substances and in providing assistance to further researches in the same field.

THE EUSTACHIAN TUBE

Die fetale und postfetale Tuba Eustachii. Anatomisch-histologische Untersuchungen. By Adolf Schwarzbart. (Pp. 160; 80 figures. No price given.) Cracow: Académie Polonaise des Sciences et des Lettres.

This is a much-needed critical work dealing with a part which is of great importance to practitioners, whether they specialize on the ear and throat, or, in the ordinary course of routine work, meet with cases of deafness which are due to disordered function of the tube, or spread of infection from the nasopharynx to the middle ear. It deals with the subject from the anatomico-histological and physiological aspects and is a comprehensive research, which includes a historical survey of the various problems which have engaged the attention of such pioneer authors as Valsalva, Reichert, Troeltsch, Toynbee, and others. This is followed by accounts of the development and anatomy of the tube; its physiological aspects; the various methods which have been adopted for its study by the author; a criticism of the customary division of the tube into an osseous and a cartilaginous part, in which the author expresses his opinion that the osseous segment is merely a forward prolongation of the tympanic cavity and would be better designated "protympanum," whereas the term "tube" should be limited to the cartilaginous part. This section is followed by valuable observations on the various folds, the lateral-tubal tissue, and the passive part which is played by the membranous part of the tubal wall in the mechanism of ventilation; the cartilage, glands, and lymphatic tissue have all been carefully studied with the help of modern histological technique, and special attention has been devoted to the study of the loose embryonal connective tissue, which the author names "pneumatization tissue," and which he considers is of great importance in providing for the enlargement of the cavity of the middle ear and for the formation of air-sinuses which are formed in relation with the main cavity, these sinuses being comparable with other air-sinuses of the skull and being lined by mesothelium.

The book, although limited in its scope, contains a large amount of interesting information, and would well repay translation into the English language.

SURGICAL HANDICRAFT

Pye's Surgical Handicraft. A Manual of Surgical Manipulations, Minor Surgery, and Other Matters connected with the Work of House Surgeons and of Surgical Dressers. Edited by Hamilton Bailey, F.R.C.S. Eleventh edition. (Pp. 512; 375 figures. 21s. net.) London: Simpkin Marshall; Bristol: John Wright. 1939.

The eleventh edition of Pye's *Surgical Handicraft* appears as a composite revision, the work of twenty-nine authors under the editorship of Mr. Hamilton Bailey, who may be said to have already achieved a reputation for the production of successful textbooks. In the preface he tells us that only eight books out of every thousand published live for twenty years. It is now fifty-four years since Walter Pye's vade-mecum first appeared, so that it follows that a popular and much-needed work was then put on the market. This was incidentally one of the first medical books issued by Messrs. John Wright and Sons of Bristol, whose high standard of publication is now very well known, and is further exemplified by the present volume, the text of which is delightfully clear, while the illustrations are excellent. The eleventh edition brings Pye's

manual well up to date. Chapters on "The House Surgeon and the Nursing Staff," "Medico-legal Reports," "The Certification of Death and Reporting to the Coroner," and "The House Surgeon in the Radiological Department" will be helpful to the young house officer taking up his first appointment, while the body of the work contains much of a practical character to guide him also. During their period of dressing, students also will find useful guidance from the book.

Figure 67 on page 61 might be better the other way up, because a straight needle is better used by pushing away from the operator, a curved needle by working towards him. The arrest of haemorrhage from the lingual artery might usefully be included in Chapter I. We regret the omission of illustrations of the various dental forceps, and the manner of applying and holding these, which appeared in earlier editions, since they were helpful to the practitioner faced with a dental extraction. The chapters on fractures by Mr. Watson Jones are some of the best in the book, and this new edition should maintain the popularity of a well-established work.

Notes on Books

A ninth edition of *Recent Advances in Medicine*, by G. E. BEAUMONT and E. C. DODDS (J. and A. Churchill, price 15s.), has recently appeared. A thorough revision of the book has been undertaken and many of the sections have been entirely rewritten. There are chapters on the chemistry and clinical applications of the sulphanilamide preparations; vitamins; sex hormones; types of anaemia and their treatment; blood and urine analysis; and tests of hepatic function. In the chapter on the kidneys the various tests of renal function are considered in detail and the types of nephritis and nephrosis and their treatment are discussed. In other sections of the book there are useful notes on the applications of mandelic acid, salyrgan, novurit, doryl, and mecholyl. The chapter on the dietetic treatment of diabetes has also been very largely rewritten.

Health at Fifty is published in this country by the Oxford University Press at 12s. 6d. These twelve articles, edited by Dr. WILLIAM H. ROBEY, emeritus clinical professor of medicine in the Harvard Medical School, have been selected from the "Health Talks" given free to the lay public on Sunday afternoons almost continuously since January, 1907, by members of the Harvard Medical Faculty. Other talks, such as those dealing with diabetes, Bright's disease, and tobacco, have been published separately. Thus biased, readers will not be surprised by the sound common-sense advice that characterizes these chapters, and should be known to every man of 50 years of age, on heart disease, blood pressure, underweight and overweight, rheumatism, care of the eyes, vitamins, the endocrine organs, the family medical cabinet, and the cancer problem. The editor, who must be congratulated on the result of his choice and editing, has contributed the last of the apostolic articles on "preparing for a comfortable old age," in which he mentions a nonagenarian patient of his who for eighty years has smoked three cigars every day.

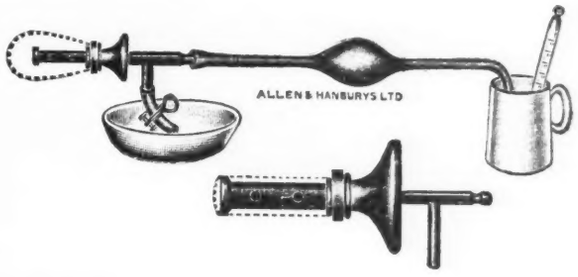
Statistical Tables for Biological, Agricultural, and Medical Research, by Professor R. A. FISHER, F.R.S., and Mr. F. YATES (Edinburgh: Oliver and Boyd, 12s. 6d.), will be found very useful to those who wish to apply modern statistical tests to laboratory or field data. The type is clear, and in addition to tables of t, χ^2, z, and other quantities of particular importance in the theory and practice of sampling, there are tables of logarithms, angular transformations, squares, square roots, reciprocals, random numbers, orthogonal polynomials, and Latin squares. The book will be a godsend to a statistician whose luggage must be reduced to a minimum—say, on a summer holiday. Worked examples of the uses of the tables are given. The beginner may feel the need for some preliminary study, and a select bibliography is provided for him.

Preparations and Appliances

VAGINAL HOT WATER APPLICATOR

Mr. KEITH DUFF, F.R.C.S., M.R.C.O.G., writes:

The successful conservative treatment of pelvic inflammation depends in the majority of cases upon the efficient use of the hot douche. For those who can afford it, or where the apparatus is available, short-wave diathermy, or the Elliott apparatus, etc., are more satisfactory, but in the main the only method of applying heat to the pelvic organs is still the hot douche. This has many disadvantages. The object is to obtain a high intrapelvic temperature over a considerable period of time, and this means a large quantity of fluid given in such a manner as gradually to increase the temperature, and to distend the vaginal vault so that the heat may be in the closest contact with the inflamed organs. In practice it is found that there are few nurses who, without special instruction, give such a prolonged hot douche in an efficient manner; the temperature of the fluid when it reaches the vagina is often only a few degrees above blood heat.



The present apparatus was evolved to obviate some of the difficulties. It consists of a hollow vulcanite stem with an obturator at one end to occlude the vaginal entrance. An ordinary rubber finger-stall is placed on the stem and held in position by a stout rubber band. The external end of the stem is connected to a Higginson syringe by a short rubber tube. The stem is lubricated and inserted into the vagina, the obturator being pressed against the introitus. Water at 105° F. from a container is pumped in, thus distending the finger-stall within the vagina, the amount being gauged by the sensations of the patient, though usually three or four squeezes of the Higginson syringe are enough. This is retained for three minutes—by which time the temperature of the injection has fallen to blood heat—and then emptied through the side tap into a receiver. This procedure is repeated twice, and then enough hot water is added to the container to raise the temperature by 5° F. Two more injections are then given, and the temperature again raised by 5° F. In this manner the temperature can be raised to 125° or 130° F., and kept at that level for as long as may be required. The advantages of the method are: (1) small total quantity of water needed; (2) no bed-pan is necessary, and the patient can be treated in comfort—indeed, the patient is most conveniently treated in the left lateral position; (3) the distended fingerstall is soft and elastic and fills the vaginal vault as no douche can do; (4) the temperature can be easily and correctly regulated; (5) all apparatus is convenient to the hand, the vaginal part being self-retaining; and (6) the patient can easily be taught to treat herself efficiently. This instrument has been made for me by Allen and Hanburys Ltd., 48, Wigmore Street, London, W.1.

LONDON COUNTY COUNCIL HOSPITALS

At the meeting of the London County Council on May 2 Mr. SOMERVILLE HASTINGS, chairman of the Hospitals and Medical Services Committee, stated that the net expenditure on hospital maintenance for the nine months April to December, 1938, was £4,316,125, the expenditure for the full year, to the end of March, 1939, being estimated at £5,789,500. One of the provisions for the coming year was 500 more beds for maternity cases. An increase of over £1,000,000 had occurred in the annual estimates for hospital services since 1934. This increase was partly due to the introduction of the 96-hour fortnight for nurses, increased ratio of staff to patients, larger salaries to staff nurses, and increased expenditure on whole-time and consultant medical staffs. The estimated capital expenditure on hospital services during the last financial year had been £650,000.

Dame BARRIE LAMBERT moved to instruct the committee to appoint two whole-time pathologists for the purpose of conducting further research, either in the Council's laboratories or in collaboration with the Medical Research Council, into the causes and prevention of (1) influenza and the common cold, and (2) measles. She referred to the devastating nature of an influenza epidemic, and to the little that was known about the cause; even less was known about the cause of the common cold. More research should also be done on measles. She suggested that £2,000 be granted for research into influenza and the common cold and £2,000 for research into measles. Dr. MONCKTON COPEMAN seconded. Mr. SOMERVILLE HASTINGS replied that so far as measles was concerned much was being done already by the Council. Special reports had been issued, and another was in preparation. As for prevention, in spite of the various facilities and propaganda only 7 per cent. of London children were inoculated against diphtheria, and it did not seem as if there was any guarantee that parents would be more willing to have their children inoculated against measles, even assuming they were successful in finding the right inoculant. With regard to influenza and the common cold this was a national problem, and the Council had no special facilities for such research. The Medical Research Council was already working in this field.

On a division Dame Barrie Lambert's amendment was lost.

Their Use in War Time

A further amendment in the name of Miss VICKERS asked the Committee to employ an expert to survey the grounds of the Council's hospitals to ascertain where it would be possible to grow food in time of war, and to advise as to suitable crops. In time of emergency the grounds of hospitals might be used for the cultivation of vegetables for hospital use. Mr. HASTINGS pointed out the difficulty that the Ministry of Health might wish to build in the grounds in emergency—in fact, in the case of three hospitals there were already plans for the erection of temporary hutments. With regard to hospitals outside the central area, however, he was prepared to agree to asking the Ministry of Agriculture to inspect the grounds with a view to making use of them in the event of war.

The Ministry of Health is being requested by the Council to conduct an investigation into certain statements reported in the public press as having been made by a member of the Council regarding the administration of St. Charles's Hospital, Kensington.

A year ago the Mental Hospitals Committee of the Council reported that, for the first time since 1891 (excluding the war years), the number of persons leaving the Council's mental hospitals in a year had exceeded the number admitted. Figures now reported for the succeeding year show a similar result. The committee expresses the hope that these figures indicate that the peak of mental disease and disorder in London has been reached. At the same time it is considered premature to draw definite conclusions as to the future position from this small decline, and the effect which the Criminal Justice Bill, now before Parliament, will have on the Council's liability to receive mental cases which, as the law now stands, would go to prison must not be disregarded. The total number of mentally afflicted persons belonging to London maintained at the Council's charge on January 1, 1939, was 34,297 (15,280 males, 19,017 females), a decrease of thirty-four as compared with the number on January 1, 1938.

Nova et Vetera

JOHNS HOPKINS MEDICAL HISTORY CLUB

On November 10, 1890, the first meeting of the Johns Hopkins Hospital Historical Club was "called to order" by William Osler. By this modest, even anaemic, statement hangs a tale the quiddity of which will be revealed when the Club comes to celebrate its fiftieth birthday next year. If it is true that the place which knew him shall know him no more, his rare spirit has in perpetuity impressed itself upon an organization which is surely unique in that, devoting its existence to the furtherance of an academic discipline regarded by many as a mushroom growth, it has met uninterruptedly ever since its foundation. One who casually attends the meetings of this the oldest medico-historical society still in existence is pleasurably engrossed by the typically Oslerian blending of the man and the book which is the dominant feature of its intellectual constitution and which was delightfully in evidence at a recent gathering on February 13. The erudite discourses of Dr. Howard B. Adelmann of Cornell University ("The Embryological Treatises of Hieronymus Fabricius ab Aquapendente") and of Professor George W. Corner of the University of Rochester ("Anatomical Illustration and the Fine Arts") were illustrated in the best sense of the term—the simplicity of the legends being as refreshing as the studied absence of overcrowding—by a number of exhibits from the Welch Medical Library. One phase in the development of realistic illustration was the scientific study of proportion, based on dissection, by the great Renaissance artists. One exhibit showed the influence of Vesalius on men like Geminus, de Valverde, and du Laurens; Stephan von Kalkar's illustrations particularly revealing a high degree of anatomical correctness and artistic merit. Baltimore boasts of three medical history clubs: the Johns Hopkins Medical History Club, the Osler Society of the Medical and Chirurgical Faculty, and the Cordell Society of the University of Maryland. These co-operate in that each society has a definite month assigned for its meetings to which the other two are invited. This happy arrangement may partly be responsible for the excellent attendances, which the History Section of the Royal Society of Medicine might view with mixed feelings of astonishment and envy. But then Baltimore is not London.

W. R. B.

THOMAS DAVIES, 1792-1839

A century has gone full circle since Thomas Davies died on May 30, 1839, at the age of 47, of the disease which had banished him to the warm sunshine of France. At the Necker Hospital he sat at the feet of Laennec, and after taking the Paris M.D. in 1821 he began medical practice in London. In a series of lectures, later published in book form under the title *Lectures on the Diseases of the Lungs and Heart* (1835), he helped to introduce the new art of auscultation to his countrymen, established his professional reputation, and stimulated the authorities at the London Hospital to create for him a special post as assistant physician. He became a Fellow of the Royal College of Physicians a year before his death of consumption. Fond of admonishing his patients to keep up their spirits, in his own last illness he failed to practise what he had preached.

BRITISH MEDICAL JOURNAL
LONDON
SATURDAY MAY 20 1939

CHRONIC DISORDERS OF THE SMALL INTESTINE

Apart from acute conditions such as typhoid fever and enteritis following infection with food-poisoning and other bacteria, diseases of the small intestine in itself take up only a short chapter in textbooks of medicine, though the effects of acute obstruction are among the major abdominal crises of surgery. It may be that the upper and lower parts of the digestive tract are more easily accessible to investigation, and so have been better studied. Survival with some degree of health and fitness may follow removal of the stomach, or of large portions of the colon, though in the latter case the absorption of the fluid needed for daily life is often difficult to maintain. The small intestine is so fundamentally important in the digestion and absorption of food that its useful work and good conduct are part of the necessary routine of living. It is structurally a tube of involuntary muscle lined by a much-folded secretory membrane. The muscle has inherently the functions of involuntary muscle elsewhere—irritability, contractility, conductivity, and initiation of rhythmic movement. These are controlled to an unknown extent by the involuntary nervous system, the functions of which are not wholly understood; but there may be noted the complexity and seeming aimlessness of the autonomic nervous system as compared with the simplicity and direct course of the voluntary nervous system, which has considerable control over the upper and lower portions of the alimentary tract. The effect of the nervous system on secretion is even more ill defined. Clinical syndromes were described ten or fifteen years ago by Porges, in which dyspepsias of the small intestine occurred through secretory anomalies, leading to fermentation of starches, putrefaction of proteins and their breakdown products, or mal-digestion of fats, but this differentiation has not been established. Since then greatly improved radiological methods have enabled the small intestine to be viewed during the passage of food, and though the details of physiology are still obscure much has been learned.

In a lecture published this week Sir Edmund Spriggs contributes a review of the present-day position in the light of his own experiences. Excluding the acute conditions of enteritis and obstruction, and ulcer of the first part of the duodenum, as this is essentially a peptic ulcer, he devotes himself to the causation and pathology and the clinical aspects of diagnosis and treatment of the more chronic disorders of the small intestine. With the material observed by himself and his colleagues he discusses the clinical features of diverticula of the small intestine, tuberculosis of the bowel, and the regional form of ileitis which has been given prominence by the papers of Crohn. Among the conditions which have shed light on the functions of the deranged small intestine are those in which patients have been submitted to gastro-enterostomy. The more efficacious the operation, the more nearly is a clear experiment on the small intestine obtained. Symptoms arise from the rush of only partially prepared food into a part of the bowel accustomed by Nature to receive a fluid chyme—usually discomfort described as flatulence, distension, or pain—and from deficiency of absorption, especially of fats. Other foods appear to be absorbed well, and the wasting noted in many patients after gastro-enterostomy is probably due to discomfort causing the patient to reduce the intake of food. Glycosuria of an alimentary type also occurs. In other cases symptoms arise from the abnormal course of the bile and pancreatic secretions. Another group of symptoms follows from alterations of peristalsis, brought about by change in the mechanics of the alimentary tract. These, too, may be complained of as a sense of distension or flatulence. Interference with the jejunum and ileum in other parts of the abdomen by adhesions from inflammation or operation may also cause similar disagreeable symptoms; but these may, nevertheless, be absent in such conditions as abnormal position or considerable matting together of the intestines and in diverticulosis even in an advanced stage. It is noteworthy that the symptoms of duodenal ileus and visceroptosis are worse when the patient becomes tired and some relaxation of the abdominal muscles takes place. There is much similarity in the complaints of the neurasthenic patient and of the patient with mild chronic partial obstruction of the gut or with local disturbance of the tone of the bowel muscle caused by the presence of diverticula, so that the differentiation may be difficult.

The symptoms of acute obstruction of the bowel are those of vasomotor shock followed by toxaemia —symptoms of secondary effects on other parts of the body, as if the intestine were too primitive to obtrude into consciousness. In more chronic states of interference with bowel function reiteration of the stimulus may gradually force a pathway into consciousness, especially in people of greater sensitiveness. The symptoms will vary in intensity with the patient's make-up. The commonest is that of flatulence—an uncomfortable feeling of tenseness without necessarily any distension; it may be even that the distension is produced later by the air-swallowing efforts the patient makes to obtain relief. This phase appears to be due to altered tonus of the intestinal muscle. In severer cases there is (commonly several hours after food) a feeling of light-headedness, giddiness, even temporary faintness and palpitation, and here there is probably a small intestine shock with hypoglycaemia. In some of these cases the blood-sugar curve after glucose administration shows a rapid rise followed by rapid fall. The symptoms appear to be associated with the rapidity of fall in blood sugar rather than the low level. In still other patients there is general muscle slackness, tiredness on slight exertion, and low blood pressure, a feeling of unfitness for work, and atonia of muscles comparable with the symptoms of primary muscle disease; in some, suprarenal insufficiency may be suspected. Physicians treating cases of chronic gastro-intestinal disorder will find nearly half their patients fall into the so-called functional group. The condition has been variously ascribed to allergy, dietary deficiencies, endocrine disturbances, and presence of focal or intercurrent infections. Some regard these functional disorders as psychogenic; certainly they occur most often in those people whose emotions are easily kindled, strongly felt, and restrained or controlled with difficulty. On the other side of the borderline is the group of patients described by Sir Edmund Spriggs. After it was established that the symptoms were not due to colitis or "nerves" but arose from jejunum or ileum, treatment by medical measures was in about half the patients successful in bringing relief. This consists of a non-irritating diet, paraffin, belladonna, and the regulation of the energies and stresses of life. Interruption of treatment is apt to be followed by a relapse of the symptoms, which again may be controlled with care. Surgical removal of the affected part has succeeded in bringing relief to a certain number. The symptoms complained of by the patient are not otherwise explained. Moreover, patients are relieved by treatment directed to the condition present and are unrelieved by removal of the appendix.

WHAT SHOULD THE ANATOMIST TEACH?

Wise words concerning the teaching of anatomy to medical students come from Dr. Donald Mainland, who holds the chair of anatomy in Dalhousie University, Halifax, Nova Scotia.[1] "British anatomy," he holds, "as taught to students, has for almost a hundred years been not only dead and unscientific but in many respects unpractical." American schools, on the other hand, he believes to possess "a greater variety in their teaching than do British schools and, most important of all differences, the outlook of American anatomists is that of the earlier British anatomists, Harvey and Hunter." He makes, however, this important admission: "British anatomy is now being revivified by a return to the methods of Hunter without neglecting regional anatomy as American teachers have been apt to do. The change is coming rather more readily in England than in Scotland." Certainly Professor Mainland is well qualified to compare anatomical teaching on both sides of the Atlantic. He learned his anatomy in Edinburgh, and for the past ten years has taught it in a university which has given him easy access to colleagues in Canada as well as in the United States.

Anatomy, in the opinion of many of its professors, has fallen on evil days; the time allotted to its teaching is being curtailed more and more. Professor Mainland does not bemoan the new conditions; on the contrary, he declares that "to an anatomist with an unbiased view of the whole curriculum a small allotment of time is a challenge to make the best use of it." He would save time, in the first place, by teaching the anatomy of the living body, using the dead body only as a means to this end. He would save time, in the second place, by teaching so that too great a strain is not made on the memory of his students; a multitude of isolated facts overwhelms the memory, whereas these same facts when strung on the string of practical clinical application are assimilated and retained. To teach in this way "the anatomist must maintain an ever-renewed acquaintance with general and special medical literature and as far as possible attend clinical meetings." He touches, too, on the relationship which ought to exist between anatomist and physiologist. "It is doubtful," he writes, "if outside a medical school one would think of teaching the structure of a machine without mentioning how it works, as has long been done in British anatomy." He holds that the movements of the body and of its organs, especially the physiology of joints, should fall within the purview of the anatomist. One cannot explain

[1] *Nova Scotia Medical Bulletin*, May, 1938.

the structure of the heart unless its movements are considered at the same time, nor can the anatomy of the thorax and body wall be understood unless the mechanism of respiration is touched upon. Among those who receive a high meed of praise for additions made to modern practical anatomy a foremost place is given to the late Professor Wingate Todd of Cleveland, who received his early anatomical training in Manchester.

Should a teacher be dogmatic? Certainly many of the professors most belauded by their students gave all their statements clear-cut and fixed edges, whereas the truth is that every living structure is subject to a range of variation—sometimes of great range, sometimes not so great. Many of Professor Mainland's own investigations have been directed towards the range of variation which is met with in the blood of healthy and apparently normal individuals. "Conflicting views," he says, "are often more educative than plain facts." He is surely right, too, when he suggests that "the whole medical course can do little more than set a student on the proper path, help him to learn for himself, and try to induce him to think." One final and important piece of advice he offers to teachers. He counsels them not to overload the memories of their students with special subjects, but rather to guide them to the special publications they may appeal to in case of need.

RESEARCH IN PREVENTIVE MEDICINE

We print at page 1048 an announcement about the setting up by the Medical Research Council of a Committee on Research in Preventive Medicine. The new committee will be on the same footing as the many others which the Council now has in being for special subjects. It will fill a gap between the Clinical Committee, which is concerned almost entirely with questions of curative medicine, and those committees —such as the Bacteriology Committee—which are interested primarily in laboratory researches. On the side of industrial health the Council already has an organization, but this does not help it in work directed to practical problems of more general scope. The announcement gives a list of the members who have been appointed in the first instance, and also indicates the principles on which they have been chosen. Among the problems which the new committee may be expected to tackle are: the best methods for use in mass-immunization against diphtheria, and the value of immunization against whooping-cough; the prevention of cross-infections in hospital wards; means of reducing the high mortality rates in infancy and childhood due to bronchial pneumonia and to enteritis; and the efficacy of terminal disinfection after attacks of infectious disease, and of the exclusion of contacts from school. It seems likely that the committee's programme will develop along these lines, but there are of course many other subjects which it might in time take up, including problems of nutrition in childhood. Various investigations of these kinds have been promoted or assisted by the Medical Research Council in the past, and some of them are in progress now. It is hoped, however, that the new committee will help the Council to make greater efforts in this field, and will at the same time secure the necessary co-operation of those engaged in public health work.

THE PROBLEM OF INVOLUTIONAL MELANCHOLIA

For many years there has been dispute about the systematic and aetiological position of the states of depression which are a common occurrence of later middle life. Kraepelin, though his attitude varied throughout his life, finally included them in the great group of manic-depressive illnesses. Many psychiatrists have subsequently found this position unsatisfactory. From a symptomatological point of view the depressions of later life show a number of differences from those of unquestioned manic-depressive nature. Their prolonged course, not infrequently ending in a state of chronic and incurable depression, the frequency of severe agitation, of hallucinations, of delusions, often of a bizarre and especially hypochondriacal nature, are to a large extent distinguishing characteristics. From the aetiological point of view it has been noticed how often an organic factor must be held at least in part responsible, and the attempt to distinguish between "arteriosclerotic depressive states" and other types of involutional depression must often fail, if made purely on symptomatology. Studies of the hereditary aspect of these illnesses have shown that, in some cases at least, there is a relationship to schizophrenia. The final state of psychiatric opinion—so far as anything is final—has therefore been somewhat confused, and it is tempting to believe that under the rubric "involutional melancholia" a number of fundamentally different clinical entities are gathered together, for convenience and lack of knowledge, which should be more properly distinguished one from another. The latest attempt to separate out a clinical entity from this group of illnesses has been made by Palmer and Sherman.[1] Their findings are of interest, not least from the prognostic point of view. Following up after five years twenty-five men and twenty-five women who had illnesses diagnosed as involutional melancholia, they found that thirty-one (62 per cent.) had remained chronically ill or had died. The outcome was found to be correlated in a remarkable way with certain personality traits. These patients did not show the syntonic or "cyclothymic" type of personality supposed to be characteristic of manic-depressives, but were rather of a rigid and often obsessional type, introverted rather than extroverted, in a chronic state of worry, inhibited, unable to engage in free and harmonious

[1] *Arch. Neurol. Psychiat.*, Chicago, 1938, 40, 762.

relations with their environment. The more marked were these characteristics the worse the prognosis was found to be, and it was only in those who had a comparatively flexible turn of mind that the outlook for recovery could be called at all hopeful. On the basis of their findings Palmer and Sherman would be inclined to regard involutional melancholia as a distinct entity, a "disease," "the involutional melancholia process," which has nothing to do with the manic-depressive psychosis, this being the end or breakdown product of an unfavourable personality development proceeding throughout life and on the whole bearing a bad prognosis. Few psychiatrists would agree with Palmer and Sherman that the outlook is so poor in the depressive states of the involutional period. The authors do not give any clear account of the method of selection of the cases they took for investigation, nor any account of the part played by organic factors. The possible influence of treatment, for instance, by cardiazol, on the course of the illness is not touched on. We now know that depression tends to be a common feature of all kinds of illnesses occurring in later life, and is not characteristic, far less pathognomonic, of any. Depression is seen as a symptom of schizophrenic and organic states, as a phase of manic-depressive psychosis, as a reaction of both normal and abnormally unstable personalities to particular sets of circumstances, and (as Palmer and Sherman would have it) as the last stage of an involved and malignant personality development. If in the individual case a systematic investigation of all possible organic and psychogenic factors is made, as well as an examination of the total personality in development and relation to the environment, the observer will not be misled by hasty preconception that the presence of an affective change denotes a favourable course.

ORALLY EFFECTIVE FORM OF PROGESTERONE

One of the main obstacles in the way of the widespread use of the sex hormones in therapeutics has been the necessity for parenteral administration. Inhoffen and Hohlweg,[1] [2] having shown that ethinyl oestradiol was twenty times more active by mouth than oestradiol itself, synthesized ethinyl testosterone and found that this substance had a progesterone-like action in the rabbit. This effect is not entirely unexpected, because Klein and Parkes[3] had previously demonstrated that various testosterone derivatives had a similar action, and, of course, the new compound is closer in structure to progesterone than to testosterone. It only differs from progesterone in the substitution of a hydroxy-group in the 17 position and the abstraction of H_2O from the side chain, leaving the triple bond ethinyl radicle. The new compound, called by its discoverers pregneninolon, has only one-third the activity of progesterone when injected subcutaneously in the rabbit. It has, however, the great advantage that, while progesterone is ineffective by mouth when given in a hundred times the subcutaneously active dose, the dose of pregneninolon has only to be doubled to be effective orally. This dose is without androgenic action on the capon. Successful clinical trials have already been reported by Clauberg and Üstün[4] and by Zondek and Rozin[5] in producing menstrual bleeding in cases of amenorrhoea. Both these reports agree that the orally effective dose of pregneninolon in women has to be six times the subcutaneous dose of progesterone. While the former authors gave the compound following ethinyl-oestradiol treatment, the latter found that it was active in producing uterine haemorrhage not only in the intermenstrual period in a normal woman, but also in a case of secondary amenorrhoea without any previous treatment with oestrogen. These results show that the new compound may be applied clinically, and it will certainly be a great boon to have a preparation that can be given by mouth, with the consequent closer control over dosage. The cost of the preparation may, however, prevent its wide use. In this connexion it may be mentioned that the discovery of the orally effective form of oestradiol has already been superseded by the discovery of stilboestrol.

[1] *Naturwiss.*, 1938, **26**, 96.
[2] *Klin. Wschr.*, 1939, **18**, 77.
[3] *Proc. roy. Soc.* B, 1937, **121**, 574.
[4] *Zbl. Gynäk.*, 1938, **62**, 1745.
[5] *Lancet*, 1939, **1**, 504.

CARDIAC PAIN

Until a few years ago the origin of pain in angina pectoris was an acutely controversial question. Many, and notably Allbutt and Wenckebach, supposed that the pain arose from tension exerted on a sensitive aorta. Others, among them Mackenzie, believed the pain to arise from myocardial ischaemia resulting from disease of the coronary arteries. The recognition that the pain in coronary thrombosis is identical with that in angina pectoris, and the demonstration of the mechanism of pain in intermittent claudication, were the chief factors determining the subsequent wide acceptance of the ischaemic theory. Recently, however, Gorham and Martin[6] [7] have resuscitated the tension hypothesis, and it may be of some interest to follow their argument. They are concerned in the first instance with the reason why in certain cases coronary occlusion is not accompanied by pain. In their first paper they proceed to analyse the clinical and pathological findings in 100 patients with coronary occlusion proved at necropsy; fifty-eight patients had experienced pain and forty-two had not. They find that the latter tended to be older, less frequently had a history of hypertension or anginal pain preceding the occlusion, and complained of breathlessness more often than those patients in whom the coronary infarction gave rise to pain. "A combination of actual thrombosis of the coronary artery and acute infarction was accompanied by pain in every one of the fifteen instances in which these two factors were present. A combination of fibrotic narrowing of a coronary artery, without actual thrombosis, plus old infarction and absence of pericarditis was not accom-

[6] *Arch. intern. Med.*, 1938, **62**, 821.
[7] Ibid., 840.

panied by pain in twelve of seventeen patients. All the five patients who did have pain suffered from only a slight degree of it; dyspnoea was the dominant symptom in four of these cases." It may come as some surprise to the reader when, on the basis of this evidence, the authors conclude that "the tension factor seems to offer a reasonable explanation not only for the presence but for the absence of pain in cases of coronary occlusion." "Briefly, according to this theory, the pain in coronary occlusion varies with the speed with which increased tension is produced on the wall of the coronary artery proximal to the obstruction and with the pathological changes in the wall, whether these changes are due to reduced elasticity or an actual degeneration of the sensory nerves." In their second paper Gorham and Martin go on to show that in the dog pain results from tension exerted on threads passed through the adventitia only of the coronary arteries and placed so as not to occlude the vessel. From the human standpoint the hypothesis put forward by these workers is open to several criticisms. In the first place it is not at all clear how thrombosis of a coronary artery leads to increased tension on its walls; it is in fact well established that in most cases of coronary occlusion the systemic blood pressure falls, and it is this pressure which chiefly determines the pressure exerted on the walls of the coronary artery. Secondly, as Wayne and Laplace,[8] and subsequently others, have shown, there is no doubt that tension on the walls of the aorta or large arteries is not the cause of pain in angina pectoris, and Gorham and Martin's hypothesis would imply that the pain of coronary occlusion results in a different way. Finally, their experiments on dogs surely mean no more than that pain nerve fibres run in close proximity to the coronary arteries of the dog; there is no good reason for supposing that what is actually being stimulated is a pain ending sensitive to tension and to that alone. Gorham and Martin's papers focus attention on the question why coronary artery occlusion is painful in certain instances and not in others, but they provide no really sound basis for abandoning the ischaemic theory of cardiac pain.

[8] *Clin. Sci.*, 1933–4, 1, 103.

"PSYCHOSOMATIC MEDICINE"

The publication of a new medical journal is not to be undertaken—or accepted—light-heartedly. The bookshelves of medical libraries creak under the gathering weight of wood-pulp and printer's ink, and the research worker who has to wade through what is euphemistically called "the literature" sighs at the prospect of having yet another row to hoe, although he may be consoled by Sir Edward Mellanby's remark that "medical literature is as exciting nowadays as any in the world." But the modern renaissance of medicine is still in full flower. New activities are afoot, new ideas, new approaches, new applications. Modern conceptions of psychopathology and the analytic technique are attracting greater numbers of medical men and leading to methods of attack on disordered conditions of the body that are full of promise for the sick person. The reactions between body and mind have found their expression in the term "psychosomatic," and this term is used in the name of a journal that has just been published in the U.S.A. with the title of *Psychosomatic Medicine*, under the managing editorship of Dr. Flanders Dunbar. Its stated policy is "to encourage and bring together studies which make a contribution to the understanding of the organism as a whole, in somatic and psychic aspects . . ." and to "deal primarily with phenomena observed concurrently from somatic and psychic angles rather than from either one alone." The first issue, published in January, contains an article on "psychological aspects of medicine" by Franz Alexander, a review of recent work on the hypothalamus, and a symposium on hypertension. *Psychosomatic Medicine* should prove of value to both medical psychologists and general physicians interested in problems of functional disorder. It is to be issued quarterly at an annual subscription of 5.50 dollars, and can be obtained from the Division of Anthropology and Psychology, National Research Council, 2101, Constitution Avenue, Washington, D.C.

THE PROBLEM OF LONDON

Within the area of Greater London is contained one-fifth of the population of England and Wales. The number of people living within that area has grown by some 18,000 every three months for the last fifteen years, and during the last few years this rate of increase has accelerated. Even within the area administered by the London County Council, the borough of Stepney contains a population equal to that of Cardiff, and the borough of Lambeth has 13,000 more inhabitants than Newcastle-on-Tyne. In the outer ring are some ten boroughs each with a population of over 100,000. This extraordinary growth has taken place in spite of a falling birth rate: it is a remarkable fact that nearly 70 per cent. of the inhabitants of the borough of Hendon are over twenty-one years of age. In spite of the facts that, speaking generally, this immense mass of people is well governed, has reasonably good health, enjoys a large amount of open space, and, taking the whole area into account, is not unduly congested as compared with the people of other large capital cities, everyone is agreed that it is too large, that in some way a check should be put to its growth, and even that it should be in some degree dispersed by some means other than the bombs of an enemy. This state of things gives rise, of course, not to one problem but to many associated problems. Any study, therefore, of the conditions of life of this over-large mass of humanity, of the many causes which have led to it, and any suggestions for the amelioration of those conditions or for a better distribution of population are important and welcome. Such a study, with accompanying suggestions, is to be found in a book entitled *London's Overgrowth*, by Dr. S. Vere Pearson.[1] It is full of facts, many of which are not generally known and still less

[1] *London's Overgrowth and the Causes of Swollen Towns.* By S. Vere Pearson, M.A., M.D. London: C. W. Daniel. 8s. 6d.

fully appreciated. It is illustrated by maps, diagrams, and photographs which add great force to these statements of fact. There are chapters on London's industries, communications, transport, open spaces, housing, and on the River Thames. The volume, however, is not just one more work on housing and town-planning. It has a definite trend and purpose. The author is concerned with a relatively novel economic theory of rent, taxation, and their relations to one another. He certainly builds up a somewhat formidable case against the ground landlord and the rent-exploiter; but he does this largely by that kind of special pleading which may be defined as *ex-parte* or one-sided argumentation. Whatever truth there may be in his conclusions, whatever value in his remedial suggestions, it cannot be said that he has completely established them. There are other facts to be weighed and other arguments to be taken into account. Nevertheless, his readers cannot fail to thank him for an able presentation of a case that must be seriously considered, and for the interest which well-accumulated facts and well-ordered arguments must surely arouse.

EGYPTIAN NARCOTICS BUREAU

The report for 1938 of the Egyptian Central Narcotics Intelligence Bureau, published in Cairo by the Government Press, bears testimony to the persistent vigilance of the director, T. W. Russell Pasha, in his campaign against illicit traffic in drugs of addiction. He warns against any relaxation of the efforts so successfully pursued during the last ten years. Indeed there has been some increase during the past year in the number of convicted traffickers and of convicted addicts. Opium is the narcotic most frequently resorted to, some 1,037 kilos of the drug having been seized during the year under review. Heroin, by reason of its high price, has almost fallen into desuetude. A sensational capture of 425 grammes of heroin contained in glass tubes concealed in a loaf is reported and illustrated. A novel method of utilizing opium has grown up. Instead of chewing it the raw drug is boiled and the decoction is injected with a hypodermic syringe. It is reported that some 49,500 syringes are annually sold to the non-professional public in Egypt. The Director of the Chemical Laboratory considers that not more than one-third of the morphine content of the opium is thus extracted, and that 2 c.cm. of the solution would contain about one-ninth of a grain of morphine, but narcotine is also present. The late Dr. Askren of the Fayoum considered this constitutes "addiction in its most deplorable form for the fellahin," who pay 5 to 10 piastres for an injection. It is estimated that 75 per cent. of the contraband opium that enters Egypt comes by the Suez Canal front, while some is smuggled through the port of Alexandria, where an organized ring has been discovered within the Coastguard Service. Last year under the Egyptian narcotic law Mixed Courts replaced the Capitulations for the trial of foreign subjects. No fewer than forty-five such subjects were convicted, and sentenced to fifty-five years' imprisonment and fines of £E7,710. On the other hand, under the Treaty the Narcotics Bureau and the Police Forces have lost 50 per cent. of their expert European officers and constables, and in two years the anti-narcotic defence of Egypt will be left entirely in the hands of Egyptian police personnel. Russell Pasha has urged the Government to re-engage and retain some dozen of the present European head constables who have been the backbone of the last ten years' campaign against international traffic. The report concludes that "Egypt has shown in the past that she can kill an evil that threatens her, and must now show that she can, unaided, keep up the effort and prevent the hydra from ever again raising its poison head."

INTERNATIONAL LISTS OF CAUSES OF DEATH

The fifth decennial conference for the revision of the international lists of the causes of death was held in Paris from October 3 to 7 last, just after the international crisis. The first three conferences in 1900, 1909, and 1920 were prepared by Dr. Jacques Bertillon, who was the moving spirit in 1893 of an international nomenclature of death. After he died in 1922 the initiative in the subject of international registration and knowledge of epidemics and diseases became vested in the League of Nations, the Health Organization of which has now issued the report of the fifth revision.[1] This contains three lists of the causes of death: a detailed list of 200 items, which is the one most commonly used in the various countries, an abridged list of forty-four items, and an intermediate list of eighty-seven items. In addition there is a separate list of fifteen causes of stillbirths. The lists of the causes of death include a majority of the items in the Nomenclatures of Diseases, such as that brought out by a joint committee appointed by the Royal College of Physicians of London in 1869 and after; but the need for a separate and international list of the causes of morbidity has been recognized by the conference, and a recommendation was passed to the effect that the joint committee appointed by the International Institute of Statistics and the Health Organization of the League of Nations should undertake, as in 1922, the preparation of international lists of diseases. The conference considered it of the utmost importance that serious efforts should be made in every country to give medical practitioners and students special instructions in the principles on which death certificates should be made out. It is noteworthy that all the recommendations of the conference were adopted unanimously and without the need for any voting. This result was due to the spirit of conciliation shown by those participating in the conference, and also to the considerable work done in preparation, among others by the national Nomenclatures Committees set up for this special purpose in England and the United States.

[1] *Bull. Hlth. Org. L.o.N.*, 1939, **7**, Extract No. 34, p. 943.

WAR WOUNDS AND AIR RAID CASUALTIES

The following is one of a series of lectures on the Treatment of War Wounds and Air Raid Casualties recently delivered at the British Postgraduate Medical School

GUNSHOT WOUNDS OF THE CHEST*

BY

G. E. GASK, C.M.G., D.S.O., F.R.C.S.

In the latter years of the great war we saw many changes in the treatment of gunshot wounds of the chest. During the first two years of war very little was done. The usual treatment afforded was to put the patient to bed, give him some morphine and a cough mixture, and hope for the best. If an empyema formed a portion of rib was excised and the pleural cavity was drained by means of a tube. As might be expected, the mortality was great, and in non-fatal cases convalescence was often prolonged.

The reasons for the non-intervention were three. First, experience of the South African War, where the ground was dry and clean and where wounds were largely due to rifle bullets, led our surgeons to the belief that chest wounds were best left alone; secondly, it was believed that it would be fatal to open up the chest cavity without the aid of some form of pressure chamber; thirdly, it was thought that handling of the lung would provoke fast and fatal bleeding. Experience proved these assumptions wrong, and a complete change was made in our practice, not from the discovery of any new method, but by the application to these injuries of the general principles of surgery which govern the correct treatment of all wounds—namely, early mechanical cleansing by operation followed by early closure.

Types of Wounds

The types of wounds commonly met with in a casualty clearing station are as follows: the through-and-through wound caused by a rifle bullet; the through-and-through wound caused by a shell fragment; the lodging wound with retention of a large foreign body; the lodging wound with retention of a small foreign body; and the open sucking wound of the thorax, with or without retention of a foreign body.

Causes of Death and Prolonged Illness

If complicating wounds are disregarded the causes of death from pure chest wounds may be divided into three groups: deaths on the battlefield or in a few hours after admission to a medical unit due to injury to large vessels or an extensive lesion which cannot be aided surgically; deaths after forty-eight hours—these are almost always due to sepsis of the pleural cavity and its contents; and deaths at the base after seven days. In the last group again the cause of death is almost invariably sepsis. Therefore the guiding principles in treatment of chest wounds, as in any other wound, must be the elimination of contamination before organisms have had time to invade the tissues.

Channels of Infection

Granted that the chief danger to a man wounded in the chest is infection, it is necessary to see how organisms reach the chest cavity. The pleural cavity may be infected: (1) by the missile and portions of the clothing or equipment carried in by it; (2) from the wound of the lung in which a missile, a splinter of bone, or a portion of clothing may be retained; (3) through the wound in the chest wall. A wound that opens direct into the pleural cavity, through which air is constantly sucked, will always lead to infection, and unless dealt with is often fatal. Further, a wound, even of moderate dimensions, through which air is not being sucked, unless adequately dealt with, may suppurate in the course of a few days, and if the thoracic cavity is not sealed off organisms gain entrance to the pleural cavity, where they find the blood a convenient medium for growth. This accounts for many cases which exhibit septic changes only after an interval of five or six days.

Primary Measures

The principle to be aimed at, therefore, is the early mechanical cleansing of the wound, both of the chest wall and of the injured viscera; the evacuation of all foreign bodies and of effused blood from the pleural cavity; the repair or suture of the damaged lung; and the closure of the chest cavity by suture. To arrive at this, when a patient suffering from a chest wound is admitted to a casualty clearing station he should be put to bed and allowed to rest undisturbed to recover from shock. The only exception to this rule is when there is a large open blowing wound of the chest. In such a case the opening is at once closed by temporary skin suture. The relief given is immediate, and it is generally advised that a blowing chest wound should be sewn up at the earliest possible moment in the advanced medical units.

Patients with retained missiles should be submitted to *x*-ray examination for information concerning the position and size of the foreign body, the existence and extent of haemothorax and pneumothorax, and the condition of the opposite lung, cardiac displacement, and movement of the diaphragm.

Indications for Early Operation

These are as follows: a ragged wound of the soft parts; bleeding from the parietal wound; compound fracture of the ribs; suction of air into the pleural cavity; retention within the chest of a large foreign body; great pain due to in-driven splinters of bone; rapidly increasing pneumothorax due to a valve-like opening into the pleural cavity which allows air to be sucked in and prevents expulsion; and a large haemothorax which cannot be evacuated by aspiration. When none of these indications are present—that is, when the wounds of the chest wall are small and clean, such as those made by a rifle bullet, when the ribs are not splintered, when the foreign body retained is small—the patient is treated on general medical principles.

Treatment by Operation

The best time to operate is as soon as possible after the receipt of the wound, provided the patient has recovered from the initial shock. Patients bear operation well and take a general anaesthetic satisfactorily. It is unnecessary to use any form of pressure chamber.

* The substance of this lecture was presented to the ninth annual session of the Clinical Congress of the American College of Surgeons in 1918, and appeared in *Surgery, Gynecology and Obstetrics* in the following year.

Wounds of Soft Parts of Chest Wall.—Wounds of the soft parts, unless small and clean, should always be excised even if nothing further is done, because otherwise they suppurate and infection is liable to spread along the track of the missile into the pleural cavity.

Fracture of Ribs.—Excision of the soft parts leads the surgeon to the ribs. More often than not the ribs or scapula are broken, and, whether or not the chest is to be opened, the splinters of bone should at least be removed, ragged ends of rib cut cleanly off, and all dead tissue excised.

Thus the first step in the treatment of a chest wound is to make a careful complete excision of the parietal wound. In some cases this is as far as the surgeon should go. Excision of the wound allows a thorough examination, which may reveal either a bleeding intercostal artery or a large hole, hitherto unsuspected, leading into the chest, and a finger introduced into the pleural cavity may discover splinters of bone, either free or sticking into the lung. Such splinters ought to be removed, for they play a great part in the production and maintenance of sepsis.

At this stage the case has been converted into one of open haemothorax. Two courses are now available to the surgeon: he may do what is called the complete operation, opening the chest, repairing the lung, cleansing and closing the pleural cavity; or he may content himself with the excision or with suturing the parietes after evacuation of the blood from the pleural cavity either by rolling the patient or by aspiration. The decision may be difficult. My belief is that if any operation is undertaken for a penetrating wound of the chest it should be done completely, as yielding the best results in the long run.

Retention of a Large Foreign Body

By a large foreign body is meant a shell fragment of about one inch by half an inch. Such a fragment not only injures tissue but carries in with it fragments of clothing which unfailingly cause contamination. Therefore it should be a rule that all large missiles be removed at an early date. The operation may be done either by enlarging the original wound or by a fresh incision, and the surgeon is guided in his choice by the position of the missile relatively to the wound, as seen by the radiograph. Where possible thoracotomy through the wound is preferred, but in any case the original wound or wounds must be completely excised. A fresh thoracotomy may be done by resection of four inches of rib or by an incision in the intercostal space. The easiest route is probably via the fifth rib in the anterior or mid-axillary line; through such an incision with the use of a retractor or rib spreader any part of the pleural cavity can be reached. On looking into a chest thus opened the first thing seen is a quantity of blood, the greater part of which is unclotted—at any rate during the first two or three days after injury. This must be removed by mopping. The cavity of the chest is now visible, the chief objects seen being the collapsed lung, the dome of the diaphragm, and the mediastinum. The missile may be evident at once, but, if not, it may be sought by inserting the hand into the pleural cavity; if it is lying in the lung it can be felt with the fingers, and be removed either through the wound of entry in the lung or by fresh incision into lung tissue.

Lung tissue may be excised without fear, because any fresh bleeding following incision is easily controlled by suture. Continued bleeding from the lung is exceedingly rare. *Arrest of bleeding follows spontaneously from collapse of the lung; and early operation within twelve hours after injury does not cause recrudescence of bleeding.* The wound in the lung itself should be excised, when possible, in the same way as a wound of the soft parts—that is to say, it should be cleaned mechanically and sutured. It should be sutured for two reasons: first, because even if not completely freed from organisms there is evidence that the lung is capable of dealing with a considerable amount of infection, as proved by the rarity of gas-gangrene infection; and, secondly, because restoration of function is hastened.

Abdomino-thoracic Injuries

Injuries involving both the chest and the abdomen are not infrequent, and may be either single or multiple. When a missile has traversed both chest and abdomen the diaphragm is necessarily injured, and abdominal viscera may herniate into the pleural cavity. This is more often found on the left than on the right side, because on the latter the liver affords protection. The diaphragm can only be repaired efficiently from above, therefore it is wise to open the chest first, replace the abdominal viscera, suture the diaphragm, deal with the chest as already indicated, and then, if there is evidence of injury to the hollow viscera, laparotomy may be performed. The passage of a small missile through the diaphragm may not necessitate repair; in such a case, with evidence of injury to hollow viscera, the abdomen is given preferential treatment.

Haemothorax

The question often arises as to the correct treatment for a patient with haemothorax of moderate dimensions and in whom there is no retained missile and no large wound of the parietes—that is to say, a case of uncomplicated haemothorax. The majority of these cases recover with aspiration. A certain proportion, however, become infected. If it were possible to foretell which cases would become infected, then there is no doubt that they would be operated on at an early stage, the haemothorax evacuated, the damaged lung repaired, and the chest closed. So far as is known there is no way of foretelling this; therefore, to prevent any possible infection it would be necessary to operate on every case—a course which is not advocated, seeing that many of these patients get well by themselves. The usual practice is to aspirate the haemothorax as completely as possible and make every effort to detect signs of infection at the earliest moment. The only certain evidence of infection is either a positive bacteriological finding or the removal of stinking fluid. By clinical signs it is often possible to diagnose the existence of infection before organisms can be detected by the bacteriologist.

The essential treatment, as soon as infection is proved or suspected, is to empty the chest of all blood and clots. This cannot be done by aspiration; so open operation must be employed. The common practice has been the resection of an inch of rib and insertion of a tube. Provided the operation is performed within a few days after receipt of the wound it is better to do a wider resection, cleanse the pleural cavity, and close the chest, subsequently keeping the pleural cavity dry by aspiration. This method offers the following advantages: the chest may remain closed; the lung is allowed to expand and adhesions may form which will prevent complete collapse, even if the pleural cavity is subsequently drained; respiratory distress is much less with a closed chest; and if infection persists and the chest has to be drained it is very easy to take

out a few stitches and insert a tube. Drainage of a chest, like amputation of a limb, should be regarded as an admission of surgical failure.

Contraindications for Operation

These are: shock and collapse, such as would be contraindications for any surgical procedure; small clean wounds without evidence of serious intrathoracic injury; and collapse of the opposite lung as indicated by inspirating retraction of the chest wall on the side opposite to the wound—in this case an anaesthetic on opening of the chest may be fatal.

Operative Technique

Thoracotomy through the Wound.—The first essential is the complete excision of the wound, including the skin, muscles, and broken ends of rib. This having been done, the chest should be opened with fresh instruments. An incision is made from the edge of the wound through the skin along the line of the broken rib, either forwards or backwards, to obtain the best access to the cavity of the chest. The muscles are incised down to the rib and retracted, and the periosteum incised along the middle line of the exposed rib. Along this line the periosteum is stripped off with a rugine. A Doyen's periosteal rib elevator is then inserted and the periosteum entirely separated. The bone is now cut through with a pair of rib shears or bone forceps and removed. To allow free access to the pleural contents and insertion of the hand it is necessary to take away four inches of rib. The posterior layer of periosteum of rib with the parietal pleura attached is next incised with a pair of scissors along the middle of the gap. Then a retractor or rib spreader is inserted and the chest opened widely.

Thoracotomy by Fresh Incision.—As previously stated, this operation may become necessary when thoracotomy through the wound will not allow access to the injured portion of the lung—for instance, when the wound is in the lower and posterior part of the thorax and the foreign body near the hilum or in the upper lobe of the lung. Resection of four inches of the fifth or sixth rib in the anterior axillary line gives a good exposure of the thoracic contents, and if there are no other considerations this is probably the best and easiest route to follow. It has to be remembered, though, that if drainage of the pleural cavity has to be performed later on it cannot be done effectively through this incision. Therefore, if the nature of the wound and missile is such as to indicate probable future infection it may be advisable to choose a lower rib and make the incision more posteriorly. A six-inch incision is made along the line of the selected rib and continued down to the periosteum, which is stripped off the anterior surface with a rugine. With rib elevator and shears four inches of the rib are resected. The posterior layer of periosteum with the parietal pleura attached is then incised along the whole length of the middle of the gap, and the retractor or rib spreader inserted.

Procedure within the Thoracic Cavity

After the chest has been widely opened, either through the wound or by fresh incision, it is advisable to remove the blood from the pleural cavity—first, because it is easier to see what has to be done, and, secondly, because removal of the blood relieves respiratory difficulties by lessening pressure on the mediastinum. The blood can be removed by rolling the patient on to his side. Probably, however, it is better to do it by swabbing with gauze and scooping out the clot with the gloved hand; less disturbance is caused to the patient by this method. This done, the gloved hand should be inserted into the pleural cavity and swept around in order to detect and remove any splinters of bone which may be lying free, or the missile and portions of clothing. These are most likely to be found in the pleuro-diaphragmatic reflexion. Next, the foreign body, if retained in the lung, may be detected by the fingers, and with the aid of two pairs of lung forceps the affected area is brought into the opening of the chest. The lung can be handled as easily as a coil of intestine, and without causing a great fall in blood pressure.

Treatment of the Wounded Lung

A foreign body, when present, seems generally to lie near the surface of the lung, and can easily be removed; if necessary, a small incision may be made through the lung substance. The hole in the lung should now be explored for splinters of bone and shreds of clothing, and cleansed as far as possible by swabbing. When there is a large ragged wound, and it is anatomically possible, a wedge of lung may be removed or the edges of the hole clipped with scissors. In any case, whether the wound is excised or not it should be closed by catgut sutures in either one or two layers, according to the depth of the wound. Bleeding is easily controlled by such suture.

Cleansing of the Pleural Cavity

In most cases it is only necessary to cleanse the pleural cavity by swabbing it dry and clean. If, however, there has been much soiling it is advisable to wash it out with either warm saline or eusol. In any event the chest should be left dry, an essential factor in the early expansion of the lungs.

Closure of the Chest and Post-operative Treatment

Whether the operation has been performed through the wound or by fresh incision, the chest should always be closed. The relief afforded is instant and marked. An attempt should be made to repair the chest wall in layers—pleura to pleura, muscle to muscle, and skin to skin. Where a large hole has been blown through the chest wall it may be impossible to get the edges of the pleura to meet; in that case muscle should be made to cover the gap, even if a flap has to be cut. Finally, the skin should be closed by interrupted sutures. In the majority of cases healing will be by primary union.

Regular post-operative aspiration is generally required to keep the pleural cavity dry, for after a big operation there is usually a fluid exudate, which if not removed may become infected.

C. L. H. Majoor (*Nederl. Tijdschr. Geneesk.*, 1939, **83**, 1725) records a case of agranulocytosis in a man aged 51 following the treatment with prontosil for erysipelas. In the course of thirty days he had in all 52.2 grammes of prontosil album and 10 c.cm. of prontosil soluble. Although examination of the bone marrow—obtained by sternal puncture—and of the blood showed a complete absence of neutrophils, the patient recovered, though in convalescence a leukaemic attack occurred. Treatment was by two injections of pentose nucleotide intramuscularly. Majoor has collected fourteen other similar cases following the administration of prontosil for subacute endocarditis, pyelitis, gonorrhoea, and puerperal fever in patients aged from 11 to 63; of these fourteen patients ten died and four recovered.

BURDEN NEUROLOGICAL RESEARCH INSTITUTE

INAUGURAL CEREMONY

The finely equipped building of the Burden Neurological Research Institute, for investigation into the causes of mental defects and abnormalities and borderline conditions, in Stoke Lane, Stapleton, Bristol, was inaugurated by Sir Thomas Inskip, M.P., Secretary of State for the Dominions, on May 12 in the presence of a distinguished company of neurologists and others from London and elsewhere. Sir Laurence Brock, chairman of the Board

FIG. 1.—Exterior of Institute taken from the air

of Control, who is also chairman of the committee of management of the Institute, presided, and the Bishop of Bristol conducted a dedication. The establishment of the Institute has been made possible by what Sir Laurence Brock described as the princely generosity of Mrs. R. G. Burden, warden of Stoke Park Colony, within the curtilage of which the new building has been erected. Although they are two entirely separate establishments, and the Institute is not primarily concerned with mental deficiency, its proximity to the Colony, where Professor R. J. A. Berry is director of medical services, will be of great value, and the two institutions together will make Stoke Park a centre of outstanding importance in this country in the study of mental disorder and abnormality.

Address by Sir T. Inskip

Sir THOMAS INSKIP, in opening the building, expressed as a son of Bristol the pride of that city in having this new research institute within its borders. He spoke also as one of the trustees of the Stoke Park Colony and associated institutions connected with the name and munificence of Mrs. Burden and her late husband, the Rev. Harold Nelson Burden. More than thirty years ago Mr. Burden was a leading member of the Royal Commission on the Care and Control of the Feeble-minded, and his interest in this subject led to the development of the work, the full title of which was the National Institution at Stoke Park for Persons requiring Care and Control. Nothing could have exceeded the energy and enthusiasm with which Mr. Burden first founded and then managed and extended that institution. In the course of his membership of the Royal Commission he visited many countries, including Germany, that great home of scientific study, now so sadly impoverished in that respect by the expulsion of many of its most eminent scientists, and, returning, he set on foot the Colony and the Burden Mental Research Institute for the investigation of these problems on genetical lines. To this the new Institute, designed for clinical research, was a most generous sequence. It was a happy circumstance, Sir Thomas added, that the Institute and the Colony should be adjacent; the association of the two bodies would no doubt facilitate valuable study. Associated with Sir Laurence Brock as chairman of the committee of the Institute were Professor E. D. Adrian of Cambridge, Dr. H. H. Carleton of Bristol University, Dr. G. W. T. H. Fleming, and Dr. Charles Visger. As director the Institute was fortunate in securing one so eminent in his profession as Dr. F. L. Golla, lately Professor of Pathology of Mental Diseases, University of London, but he went on to say that it must not be thought that the Institute, because it had persuaded Professor Golla to come from London, desired to be in any way aloof from the great hospitals and institutions in and around Bristol; on the contrary, it was hoped that there would be the fullest co-operation.

The Director's Hopes and Plans

Professor GOLLA spoke of his hopes and plans for the new enterprise. Only those, he said, who had realized how the multiplicity of competing claims, both medical and administrative, hampered the work of the large hospital clinics would fully appreciate the advantages of such a research institute. For all such workers the Institute spelt freedom, a freedom as yet unknown in mental hospitals under public administration. The Institute was equipped in the very best way for the investigation not only of the functions of the nervous system in the strict sense of the term, but of the body as a whole, for in the preoccupation with the brain there was some tendency to forget the bodily stratum of mental disease. It was intended to take a small number of carefully selected cases and investigate them by every means available to electrophysiological and endocrinological research. To pursue these methods a band of research workers had been collected.

An immediate occupation would be the study of the varied group of pathological states of the brain which were responsible for epileptic seizures. What the neurologist called idiopathic epilepsy was the least understood of the more common nervous diseases. It was hardly an exaggeration to say that the knowledge of epilepsy had received little appreciable addition since the time of Galen until certain researches, carried out chiefly in America and in this country, had given hints as to the directions in which further investigations must take place. There were now good grounds for hoping that with the aid of certain electrophysical methods it would be possible in the near future not only to understand but to combat effectually this most distressing disease. In this work co-operation was being maintained with the Hospital for Epilepsy and Paralysis, Maida Vale, London, where many of the cases which it was proposed to study at length would have received preliminary treatment and investigation. Certain conditions causing epileptic seizures were known to be susceptible to surgical intervention, and with accurate brain localization it would be possible to remove the cause of the seizures. A good operating theatre for neurosurgery had been provided in the new Institute. Although some of the work

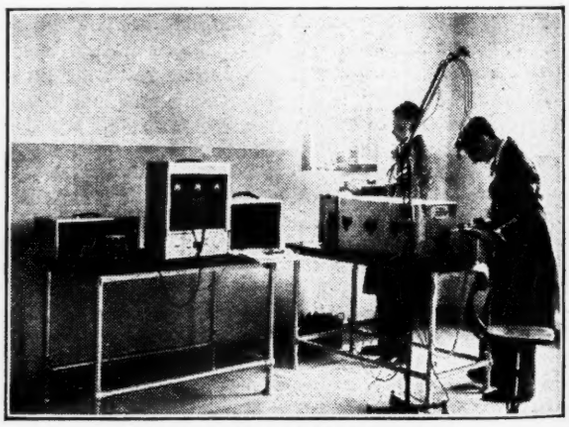


FIG. 2.—The electrophysical department.

would be done by surgeons from the Hospital for Epilepsy and Paralysis, it was hoped that some members of the Medical Faculty of the University of Bristol would use the resources provided, and the staff was anxious to establish relations with medical men interested in nervous diseases, not only in Bristol but in any part of the West Country. Another part of the programme to which great importance was attached was collaboration with medical officers of institutions for the care and treatment of mental patients. It was hoped to repeat the experiment which had proved successful in the Central Pathological Laboratory at Maudsley and to make the Institute a centre for scientific discussions. He mentioned the happiness of those connected with the Institute in being in such close

FIG. 1.—Case II. Man aged 64. The jejunum is studded with large diverticula. A distal loop shows a group of small ones (see arrows); minute ones are present still lower.

SIR EDMUND SPRIGGS: DISORDERS OF THE SMALL INTESTINE

FIG. 2.—A woman aged 57. A strial picture of jejunum and ileum, the latter showing slight hypertonus in the lower loops.

FIG. 3.—Case I. A woman aged 56. Radiograph taken in the prone position seven and a half hours after a barium meal. Great dilatation of the terminal ileum above a lateral anastomosis (arrow) to the descending colon.

PHILIP ELLMAN: HEALING BY NATURAL RESOLUTION IN PULMONARY TUBERCULOSIS WITH OR WITHOUT CAVITATION

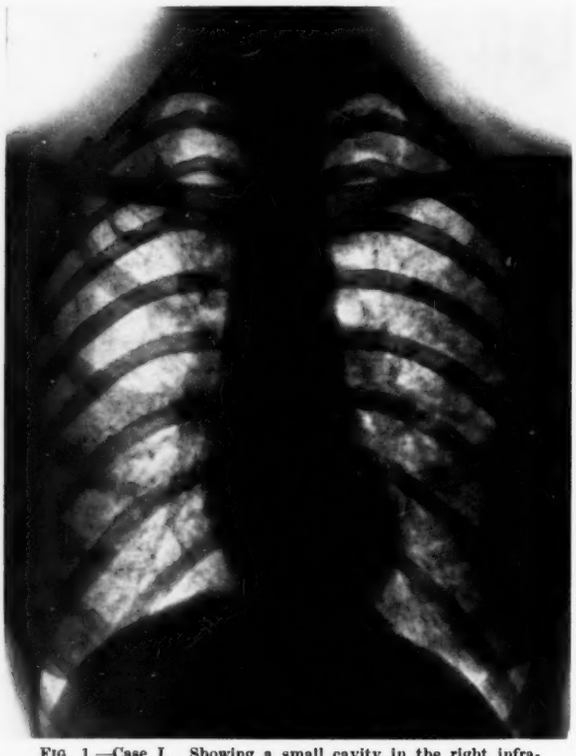


FIG. 1.—Case I. Showing a small cavity in the right infraclavicular region and scattered exudative infiltration in the middle and lower zones of the left lung.

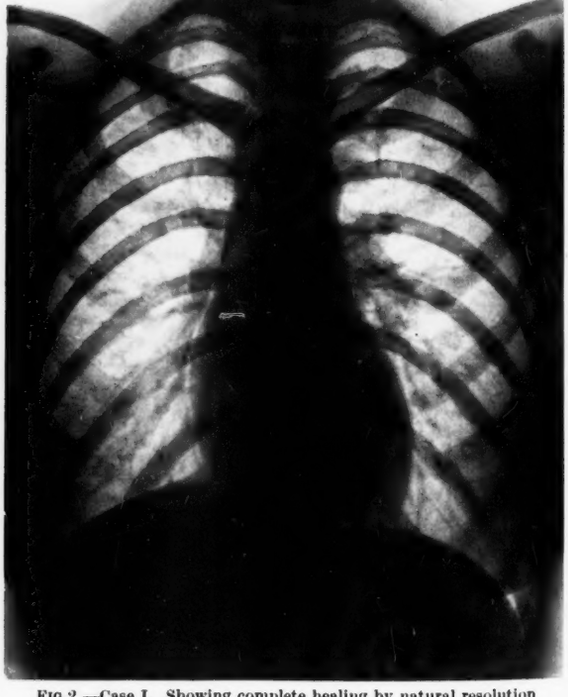


FIG. 2.—Case I. Showing complete healing by natural resolution after bed rest under sanatorium conditions for eight months.

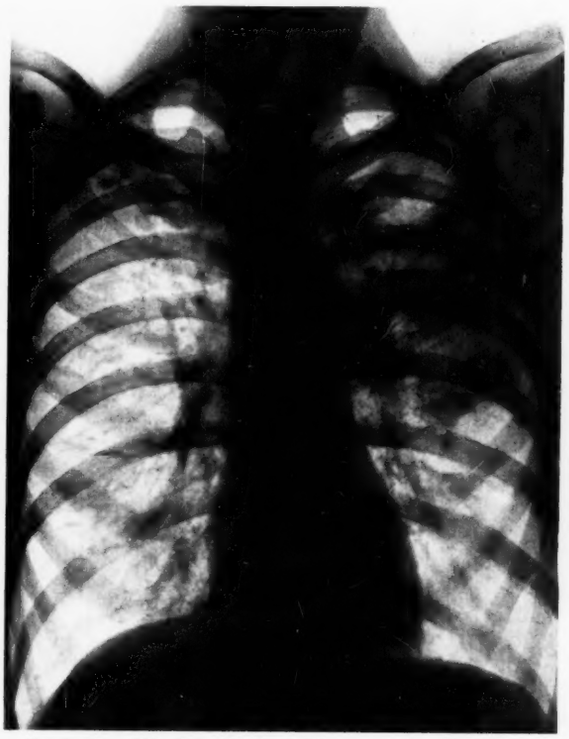


FIG. 3.—Case III. Film showing infiltration, with cavitation of the upper and middle zones of the left lung.

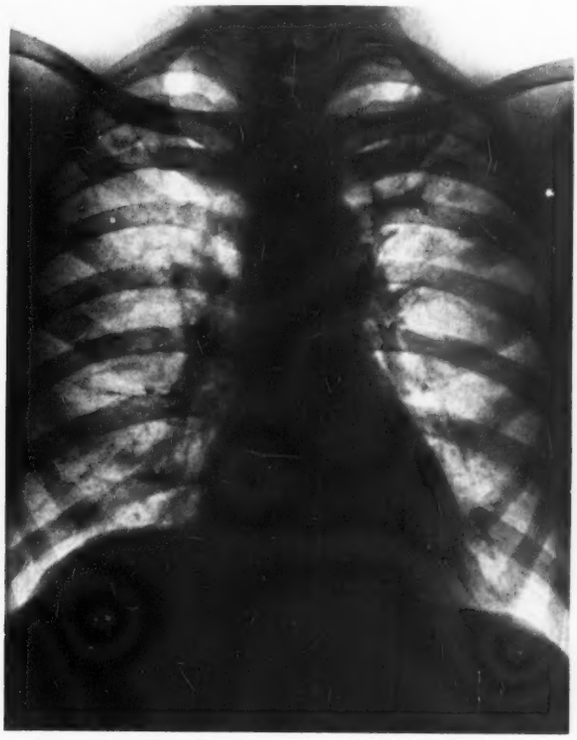


FIG. 4.—Case III. Film showing considerable resolution, with a residual area of fibrosis in the upper zone of the left lung after sanatorium treatment for ten months, including bed rest for six months.

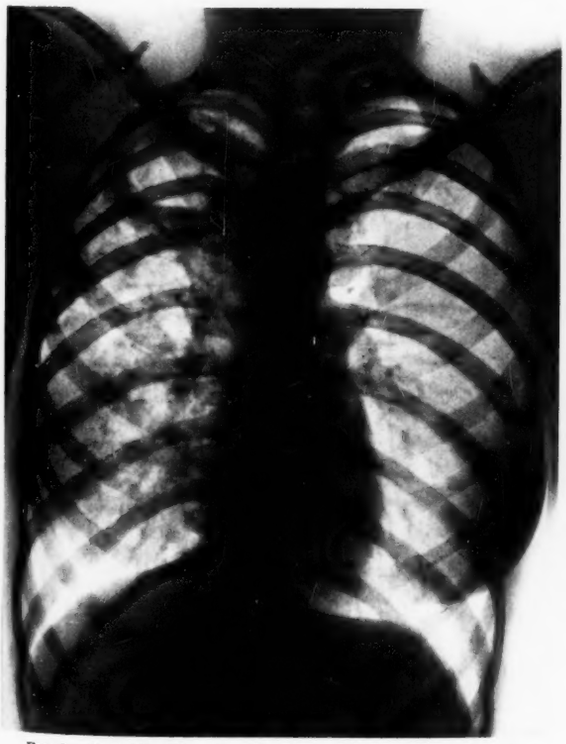


FIG. 5.—Case IV. Film showing a large cavity in the upper zone of the right lung, with a horizontal fluid level in the cavity.

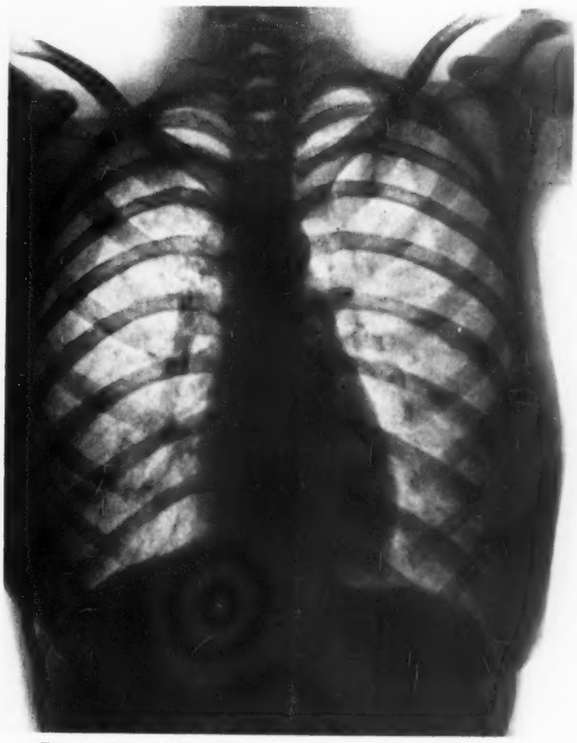


FIG. 6.—Case IV. Film showing complete resolution of the cavity after bed rest under sanatorium conditions for eight months.

FIG. 1.—Case I. Adult European male affected with "sandworm." Ten days' duration. Note the tortuous track in skin over crest of ilium. Each of the other patches represents a track which has been scratched to relieve the intense irritation.

FIG. 2.—The egg of the causal organism, about 12 μ in size, lying among debris from the track.

FIG. 3.—Developmental stage of the organism—nearing adult size.

FIG. 4.—Adult mite; stained specimen, 300 μ in length, extracted from track shown in Fig. 1. The breadth has been somewhat increased by pressure of the cover-slip; two pairs of hind legs partly obscured. Note hairs and terminal claws on legs.

FIG. 5.—Case II. Adult female mite (unstained). Obtained from the hand.

FIG. 6.—Case II. "Sandworm" of the hand. Both hands affected, and very septic. Note raised track doubling on itself at tip of third finger.

proximity to Stoke Park Colony, so that when they found themselves in difficulty they could go for advice and help to Professor Berry.

Sir LAURENCE BROCK, in calling upon Dr. Carleton and Dr. Visger to propose and second a vote of thanks to Sir Thomas Inskip, said with what pleasure he welcomed them both, but especially Dr. Visger on the committee of management, because Dr. Visger was a representative of the family doctor. Many family doctors had not taken the interest one would have wished them to take in mental medicine. He was very glad that the interests of general medicine, not associated particularly with the medical school, should be represented on the committee. Later, in presiding over a luncheon, Sir Laurence Brock said that when Mrs. Burden consulted him on the subject he was able to tell her that she could have the services of Dr. Golla, but that to provide him with the necessary equipment and, what was still more important, the necessary team would be a very expensive matter. So many of those who knew that research was vitally necessary were apt to say, "Why does not the Government do something about it?" But Mrs. Burden, when convinced that something ought to be done, did it without hesitation or counting the cost. She recognized that the endowment of research, particularly into mental disorder and abnormality, was a venture of faith. In the end research would justify itself, but it was impossible to say that this would happen within a given number of months or years. He alluded to the presence at the function of Dr. D. P. O'Brien, representative in Paris of the Rockefeller Foundation, mentioning that the Foundation had made a generous contribution to the neurosurgical department. The Medical Research Council has also made a grant for the support of some of the research work.

Equipment of the Institute

The Institute is a building of two floors, pleasantly decorated and furnished, with no institutional coldness about it. On the ground floor are two wards, one for male and the other for female patients, each designed to accommodate eight beds. In each ward there is one self-contained cubicle for a surgical case or a case requiring special observation and treatment. Apart from these cubicles each bed can be totally enclosed by curtains, and at the end of each ward there is a day-room, with windows looking out upon charming gardens. It is expected that the first patients will be received about the beginning of June. The laboratories, not all of them as yet completely equipped, include a small histological room; a metabolism room with special apparatus for studying the energy exchanges of the body; a physiological laboratory with a multispeed kymograph, dissecting microscopes, and other apparatus for the study of isolated and surviving organs; a large biochemical laboratory, with an excellent range of apparatus—torsion balance, photometers, vacuum pump, centrifuges, apparatus for measuring the acidity of solutions, and so forth: and an electrical room, one portion of which is allocated for the *x*-ray study of the brain, to which end the radiological equipment designed by Lysholm of Sweden for facilitating the localization of the disturbances of brain function is being installed. The rest of the room is devoted to apparatus for electro-encephalography and the work which it is proposed to do on the cortical potential of cases of epilepsy and cerebral tumour.

An operating theatre, with sterilizing room, equipped with modern apparatus for neurosurgery, has been provided. Outside, in a separate building, is the animal house, with thermo-regulated accommodation for rats, rabbits, and monkeys, and a special room for hypophysectomized animals. Here also is a workshop and photographic room. In the main building is a comfortable library.

The members of the staff under Professor Golla as director will be Mr. Grey Walter, whose department is electrophysiology, Dr. Max Reiss, a Czech endocrinologist, Mr. N. S. L. MacLeod and Mr. A. Tingey, biochemists, and Mr. Wylie McKissock, visiting surgeon, from the Maida Vale Hospital.

[The photographs reproduced are by F. Fowler, Bristol.]

"MOSQUITO DAY"

A MANSON-ROSS LUNCHEON

The late Sir Ronald Ross, F.R.S., established the custom of an annual luncheon at the Ross Institute on August 20, the anniversary of his discovery. The date is a somewhat inconvenient one, and therefore in future Sir Ronald Ross's birthday, May 13, will be celebrated by the "Mosquito Day" luncheon. Following the amalgamation of the Ross Institute with the London School of Hygiene and Tropical Medicine it has been thought fitting to link the name of Manson with that of Ross. The first of these annual commemorations of the two discoverers was held at the London School, the Prime Minister presiding, on Friday of last week. The principal dish at the luncheon was an Indian curry, but there were alternatives.

The toast, "The Memory of Sir Patrick Manson and Sir Ronald Ross," was proposed by Mr. A. Chester Beatty, vice-chairman of the Ross Institute Committee, whose name is associated with many great African mining enterprises. He said that the part which the London School and the Ross Institute had taken in the industrial and agricultural development of the British Empire had not received the emphasis it deserved. He quoted as showing the problems confronting mining companies a report submitted by an engineer who stated that the mosquito survey showed that practically all the anopheles known in South and Central Africa were present, with appreciable quantities of *Anopheles gambiae* and *Anopheles funestus*, the first being the principal pool breeder in the open sunlight, and the second, one of the most dangerous of the swamp breeders. Consequently there existed a serious malarial problem. There had been endless examples of the loss of capital owing to the attempted development of areas where, had it not been for the health conditions, the enterprise would have been a success. The School and Institute should be looked on as research laboratories for enterprises operating in unhealthy countries. Large sums were spent on metallurgical experiments, but the amount spent on research into the question of solving the health problems of the places where the companies were operating had been constantly placed at too low a figure.

Anti-malarial Work in the Copper Belt

Mr. Chester Beatty instanced the conditions which existed some years ago in the copper belt of Northern Rhodesia. Several of the companies operating there arranged with the Ross Institute for Sir Malcolm Watson to go out as medical adviser in the same way as experts were called in to solve the metallurgical and geological problems. When his recommendations were implemented a great betterment in health conditions took place. In 1929, when the anti-malarial work started, the number of cases of malaria per 1,000 men was ninety; in 1938 it was fifteen. The death rate in the copper belt was now less than half the death rate in Kensington, though, of course, the figure had to be qualified to this extent, that there were older people living in Kensington than in the copper belt. But the success was so complete that no man need be afraid of taking his family to that region, and thus the companies had been able to command the very best engineering skill and avoid constant changes in management. He mentioned also a rubber estate in Malaya which had increased from 1,632 acres in 1911 to four times as much, and in which in 1911 the death rate per 1,000 was 232, falling to only three in 1923, and to 0.08 in 1938.

Finally Mr. Chester Beatty produced a rough table showing the main value of the products which had specially benefited by the discovery of Manson and Ross, and the contributions given to the London School and the Ross Institute by the industries affected. The figures submitted applied to production within areas of the Empire which were more or less malarial and where the health problem was a most urgent one:

	Total Production (annual)	Contribution
Gold production in Empire	£20,119,000	£353
Tin production in Empire	61,000 tons	£823
Tea production in Empire	717,000,000 lb.	£704
Rubber production in Empire	564,400 tons	£883
Copper production of Rhodesia ..	224,400 tons	£650
Diamond exports of Gold Coast ..	£548,000	£105
Diamond exports of Sierra Leone ..	£858,000	
Railway mileage in similar areas to tea, rubber, and mining areas	3,474 miles	Very moderate

This table was not posted in any spirit of criticism; indeed, he had to confess that he was a director of some of the enterprises that lagged behind in their contributions, though when the matter was brought to the attention of the directors they were astounded, and, seeing that the contribution was totally inadequate to the sum needed, at once increased the amounts. In conclusion Mr. Beatty said that although he had spoken of the work in tropical zones, not less important work was being done for the temperate regions.

The Prime Minister

Mr. Neville Chamberlain, in response to the toast of his health, mentioned his family association with the work of combating tropical diseases. His father, when Colonial Secretary, had been deeply impressed and distressed by the fact that the men who went out to West Africa to carry on the colonial services experienced conditions under which, one after another, they rapidly fell victims to malaria. He felt that something ought to be done about it, started research into the question, and enlisted the services of Sir Patrick Manson. It was one of the outstanding achievements of the British race that Manson and Ross made their important discoveries with such potentialities for humanity and for the development of the tropical territories. Great results had already flowed from their discoveries, and had not yet been exploited as they should have been. In the School they had the instrument to do the work, if only enough support were forthcoming. He hoped there would be a suitable response to Mr. Chester Beatty's persuasive appeal by those who were carrying on mining enterprises in the countries concerned.

FELLOWSHIPS AND APPOINTMENTS IN TROPICAL MEDICINE

The Medical Research Council, advised by its Tropical Medical Research Committee (appointed after consultation with the Colonial Office) announces the following.

Junior Fellowships.—Up to three junior Fellowships are offered immediately, for award to qualified medical men or women wishing to receive training with a view to careers in research work in tropical medicine. Preference will be given to candidates who have already had preliminary experience of methods of research in some branch of medical science. Subject to satisfactory reports, the Fellowships will be tenable for three years. The first year will be spent at a school of tropical medicine; the second in carrying out research in the same or some other institution at home; and the third largely in work under direction at some centre in the Tropics. The stipend will be at the rates of £300, £400, and £500 per annum in the successive years, with an additional allowance during service abroad and necessary expenses. The Council has every reason to believe that those who undergo this training will be eligible and well qualified for various appointments, apart from the prospects of further employment under the scheme.

Senior Fellowships.—In three years' time at least one senior Fellowship will be available for candidates who have held the junior Fellowships mentioned above. This will be awarded for a further period of three years, carrying stipend at the rate of £600 to £750 per annum, with an additional allowance during service abroad and expenses. The time will be spent mainly in research work in the Tropics. The Council is also prepared to consider immediate applications for senior Fellowships from candidates who have had adequate experience in research work, whether already specially trained in tropical medicine or not.

Permanent Appointments.—The Council further intends to establish in due course, as suitable investigators become available as the result of the Fellowships scheme, permanent and pensionable appointments for research work in tropical medicine, including senior posts. Members of this research staff will work partly in the Tropics and partly in institutions at home to which they will be severally attached. The exact terms of service are still undecided, but they will be not less favourable than those which apply to other Government appointments at home or over-seas for men and women of similar professional standing.

Inquiries may be addressed to the Secretary, Tropical Medical Research Committee, 38, Old Queen Street, London, S.W.1, with whom applications should be lodged not later than June 19.

RESEARCH IN PREVENTIVE MEDICINE

Appointment of New Committee

The Medical Research Council has appointed the following committee to advise and assist it in promoting investigations into problems of preventive medicine. The members include several who are specialists in various branches of medical science, such as immunology, clinical medicine, nutrition, and vital statistics, in addition to a number of men—drawn from different parts of Great Britain—having practical experience of public health work. These latter include, by permission of the Departments concerned, members of the medical staff of the Ministry of Health and of the Department of Health for Scotland.

Sir W. Wilson Jameson, M.D., F.R.C.P., Dean of the London School of Hygiene and Tropical Medicine (*Chairman*).
J. H. Brincker, M.B., Principal Medical Officer, London County Council.
J. Fenton, C.B.E., M.D., M.R.C.P., Medical Officer of Health, Kensington.
J. Ferguson, M.B., Medical Officer of Health, Surrey.
W. M. Frazer, M.Sc., M.D., Medical Officer of Health, Liverpool.
E. H. R. Harries, M.D., M.R.C.P., Chief Medical Superintendent, Infectious Hospitals Service, London County Council.
A. Bradford Hill, D.Sc., University Reader in Epidemiology and Vital Statistics, London School of Hygiene and Tropical Medicine.
W. D. Hood, M.B., Medical Officer, Department of Health for Scotland.
J. R. Hutchinson, M.D., Medical Officer, Ministry of Health.
R. A. McCance, M.D., Ph.D., F.R.C.P., Reader in Medicine, University of Cambridge.
A. S. M. MacGregor, M.D., K.H.P., Medical Officer of Health, Glasgow.
R. H. Parry, M.D., M.R.C.P., Medical Officer of Health, Bristol.
R. M. F. Picken, M.B., Mansel Talbot Professor of Preventive Medicine, Cardiff.
W. M. Scott, B.Sc., M.D., Medical Officer, Ministry of Health.
J. C. Spence, *M.C.*, M.D., F.R.C.P., Assistant Physician, Royal Victoria Hospital, and Physician, Babies Hospital, Newcastle-on-Tyne.
W. W. C. Topley, M.D., F.R.C.P., F.R.S., Professor of Bacteriology and Immunology, London School of Hygiene and Tropical Medicine.
D. K. M. Chalmers, M.D., Administrative Officer, National Institute for Medical Research (*Secretary*).

Three years will be the normal period of service on the committee for those members drawn from public health work outside Government Departments, as it is felt that the representation of this very wide field should be varied from time to time. In addition, persons other than members of the main committee are being invited to serve on subcommittees dealing with particular problems.

Reports of Societies

"CLINICAL SENSE AND CLINICAL SCIENCE"

The annual oration to the Medical Society of London was delivered on May 8 by Professor J. A. RYLE, Regius Professor of Physic, Cambridge University, whose subject was "Clinical Sense and Clinical Science."

The term "clinical sense," he said, was sufficiently descriptive of what they most coveted for themselves and most admired in their teachers and colleagues. But what did clinical sense mean? He could not regard it as a separate faculty, or flair, or intuition, peculiar to medical men, of which others were deprived. The pure scientist and hypercritic sometimes held clinical sense to be no better than lucky guesswork, combined perhaps with that sympathetic understanding which characterized the doctor and distinguished him in some degree from people in other walks of life. But those who had observed the manifestations of clinical sense in others, or perhaps had recognized it in their own achievements, would agree that it was not something innate or intuitive, but a complex faculty, built upon training and the exercise of the ordinary senses, together with a sound knowledge of pathological possibilities. The fact that observation and ability of this kind, with the wit to interpret the phenomena observed, might on occasion lead to surprisingly prompt and exact judgments must not be regarded as mysterious or as betokening some separate and peculiar insight. The *Oxford Dictionary* gave "faculty of perception" as one of its first definitions of "sense." It was not so much a question of detecting a single physical sign as of summing up the circumstances of the illness, and the age, habitus, and environmental conditions of the patient. The judgment in such a case could not be called guesswork or attributed to a subtle insight *sui generis*. It differed only from the science and discipline of the laboratory worker in that the observations which went to form it had not been set down in protocols, but stored in a busy mind; not tested by staged experiment, but at least amplified and assisted by experience.

Clinical sense (Professor Ryle continued) might manifest itself in diagnosis, prognosis, treatment, and the withholding of treatment. In diagnosis the judgment was often referable to recollections of a kindred case, a fresh association of ideas, or a carefully elicited historical point rather than to the discovery of a new objective sign. With regard to prognosis, how often they had heard such expressions as "I believe this case is going to do well," or "I don't like the look of this man"! Were they not too content with the fact of such achievements and not inquiring enough as to the manner in which they were brought about? The general demeanour, the pulse quality, a seemingly trivial alteration in the colour or muscular tone, the lustre of the eyes or hair, the odour of the bedside, or the knowledge of the particular disease were, severally or collectively, the basis of the favourable or unfavourable opinion.

Clinical Sense in Treatment

In the field of treatment good clinical sense seemed to the orator to be more rare to-day than in diagnosis. The prevailing urge to action, sometimes too readily acceded to at the instance of the patient or relatives, the over-reliance on surgery, the vaccine craze, the proprietary endocrine allurement, the blandishments of other advertising chemists, all these had helped to lead them astray. He thought they must feel ashamed of the ready susceptibility of the profession to fads and crazes. In therapeutics there were three chief dangers: that of becoming stereotyped, that of becoming timid or disillusioned, and that of becoming crudely experimental. Good therapeutic sense was rarer than good diagnostic sense. The present generation was obsessed with treatments rather than concerned with treatment (with the big "T").

He was also disturbed as to the quality and quantity of clinical sense among those referred to as the oncoming generation, but the fault was the teachers', not the students'. Students were allowed to be impressed by a crowd of scientific facts instead of being taught the proper place and use of facts. What was wrong with medical education that it should, while multiplying diagnostic aids, be failing in the cultivation of the faculty of perception from which judgment derived? The overcrowding of the curriculum was not alone to blame. Could not teachers from the beginning give the student a better chance and stimulus by promoting his interest in living animals, their movements and behaviour, by dissections without the book, by encouraging him to study human emotions and the daily events of human physiology; could there not be combined with anatomy and physiology a better use of the living man? What proportion of students could give a reasonable physiological interpretation of fainting, of the several varieties of dyspnoea, of the many varieties of visceral and corporeal pain? He knew that clinical demonstrations in the earlier years of the curriculum were given sporadically in some schools, but could not the clinical aptitude be whetted by at least one prepared clinical illustration or problem during each week of the pre-clinical period? At present it was not impossible for a man to take first-class honours in natural sciences and yet to be a poor observer at the bedside. The inevitable subdivision of medicine into specialties had also broken the continuity of teaching. The value of the general approach to any and every case, whether a patch of eczema, an enlarged prostate, a lung condition, or an anxiety state, was in process of being forgotten. In his first years the student investigated too little; in the last years of his curriculum the student was apt to think too little.

Clinical Science

Turning to clinical science, Professor Ryle said that the advent of a new organized approach, employing new and old methods for the sole purpose of a more searching inquiry into disease in the living man, was to be welcomed. Of clinical science in this country Sir Thomas Lewis had been and was the leading advocate, and he had defined it as an attempt to understand diseases and their many manifestations as they occurred in man, and especially to make use of the experimental method. How could clinical science be best fostered? How could it render assistance to the teaching of practical medicine? Clinical science could be advanced anywhere where men of the appropriate foresight and training had the time and opportunity in their reach. It would be a grave mistake for the disciples of clinical science to withdraw themselves too much into their own laboratories and to establish research institutions which would work independently of existing hospitals and university departments. The frequent interchange of thought and discussion of problems as between the clinical scientist and the practical physician was one of the most hopeful developments, as illustrated in the clinical research units at University College Hospital, Guy's, and the National Hospital, Queen Square, in London, and at Edinburgh, Cambridge, Oxford, and elsewhere.

In the matter of the education and selection of research personnel, it had really come to this: Was it right to ask promising young men to afford the time necessary for both disciplines: that which trained for clinical sense and that which trained for clinical science? Professor Ryle said that he would not view with confidence the appointment of laboratory-trained men lacking at least a year or two of stern clinical discipline after qualification. It was true that only a small proportion of these men probably

would remain permanently in academic medicine, but whether they went back to practice or teaching or to institutional appointments under the developing schemes of municipal medicine, they would go back the better for the scientific training which they had had in the research institutions, and it was they who would be the pioneers of the new clinical medicine—the clinical medicine which combined the sense and the science.

Therefore he did not feel disturbed even if only one in ten of the excellent people he had working with him in Cambridge had the fortune to remain in academic medicine; he felt that the others would go forth as disciples and help to influence and vary teaching methods and improve practice.

"In spite of all our difficulties," Professor Ryle said, in conclusion, "the modern evolution of medicine is intensely interesting and full of promise and becoming more so. It is occasionally worth while to take stock, as I have tried to do this evening. For my part I am less anxious about the immediate future of clinical science than I am about the future of clinical and pre-clinical teaching. It should not be beyond us to discover how the training both in the sense and the science in a better manner than heretofore may become the prerogative of all our students."

At the annual meeting of the Medical Society of London, which preceded the oration, Mr. Zachary Cope was elected the next president in succession to Dr. C. E. Lakin.

MEDICINE AND THE LAW IN RELATION TO DRUG ADDICTION

At the meeting of the Section of Psychiatry (Royal Society of Medicine) on May 9, with Dr. H. CRICHTON-MILLER in the chair, a symposium was arranged on the question of medicine and the law in relation to drug addiction.

Dr. W. RUSSELL BRAIN opened by defining drug addiction as the habitual use of a drug in order to modify the personality and to diminish the strain of life. A large number of drugs might serve this purpose, but he confined his argument chiefly to the narcotic alkaloids. Drug addiction was usually characterized by tolerance, craving, and severe deprivation symptoms. These symptoms were all the outcome of the process by which the body reacted to repeated doses of the drug. The first stage of treatment was principally physiological. Its aim was to prevent the development of deprivation symptoms while the patient was weaned from the drug. This stage need never last longer than a fortnight. The next stage was convalescence. For many weeks after the withdrawal the addict would experience feelings of exhaustion comparable with those which occurred after a severe and prolonged illness. For three months after withdrawal mental and physical exertion should be carefully graduated. The third stage was after-care, a period of indefinite duration, but in any case lasting for years, during which psychological guidance was essential. Psychological treatment played a most important part in all three stages, but neither the stage of withdrawal nor that of convalescence was suitable for anything but the simplest forms of psychotherapy.

Dr. Brain classified addicts into four types: (1) the "accidental" addict, meaning the addict recovering from illness in which drugs had been legitimately used, and who found difficulty in breaking away from them; (2) the "stabilized" addict, with whom, over a certain age, it was sometimes unwise to attempt a cure (he recalled a doctor who successfully carried on an exacting country practice for many years on 2 or 3 grains of morphine a day); (3) the "criminal" addict, best defined as one who had brought himself within reach of the law by a criminal offence; and (4) the "natural" addict, the addict in whom the psychopathic element was large, who usually required relatively large doses of the drug, and who for this reason or on account of mental instability was incapable of sustained occupation, was asocial if not anti-social, and a burden to all who had to do with him. There were many addicts of this last class who could not be adequately treated without compulsory detention.

If detention was desirable, was it administratively practicable? The number of drug addicts in Great Britain was not large, probably about 700, most of them known to the authorities. Detention would be of little value unless applied for at least two years. The small number of addicts would make the provision of special institutions difficult but not impossible. Compulsory treatment of drug addicts was provided in some form in Germany, in twenty-four States of the U.S.A., in one province of Canada, and in Venezuela, China, Japan, and Egypt. Drug addicts formed a very well-defined group, the nature of their disease could be diagnosed with certainty, and there was general agreement as to the treatment they required. Chronic alcoholics were psychologically a much more varied group, and owing to the readier availability of alcohol than of dangerous drugs the results of treatment were often more disappointing. Experience had shown that existing legal provision for the detention of chronic alcoholics for purposes of treatment was of comparatively little use. In the case of sexual abnormals it was even more difficult to know what consideration, apart altogether from offences against the law, would justify compulsory detention and what would be the prospects of cure. In any case he doubted the wisdom of confining alcoholic addicts, drug addicts, and sexual abnormals in the same institution. Dr. Brain concluded by saying that doctors by their psychological constitution were authoritarians, but experience had shown that any attempt to tamper with the liberty of the subject called forth great opposition. He did not think that in the present state of knowledge the same clear-cut case could be made out for the compulsory detention of the chronic alcoholic or the sexual abnormal as for the drug addict.

Psychopathological Considerations

Dr. H. V. DICKS said that the medical psychologist's interest in this subject was twofold—theoretical and practical. In his study of many cases not primarily of addiction, as in patients with obsessions and phobias, the psychologist was struck by certain addiction phenomena. Drug addiction was a chronic compulsion to rely on the absorption of chemical substances to maintain a subjective sense of psychical and physical adaptiveness to reality. In practice the term was applied to the habitual use of narcotics and alcohol—in other words, to the partaking of substances which were pharmacologically dangerous. Most modern writers on the subject emphasized the usual aetiological factors, such as insomnia, worry, and overwork, but these causes might be very superficial. It was perhaps on the whole due to the work of the psycho-analysts and allied inquirers that such understanding as had been reached of the more specific factors had been taken beyond these generalities. It should be stated, however, that with regard to therapy there was as yet no convincing evidence of the superiority of analytical treatment. The trouble was that few drug addicts persevered long enough voluntarily. If only for the sake of research into the sociological and individual factor, and so ultimately for the benefit of the patients themselves, the question of greater compulsive powers should be considered. Perhaps with the exception of what Dr. Brain had called the "accidental" addicts all the groups raised important psychological considerations, and these had to be first settled by research before lasting success in treatment could be expected.

Dr. Dicks went on to an interesting exposition of the psycho-analytical theory regarding drug addiction. Morphine addiction occurred in persons more deeply isolated than those whose addiction was to alcohol. Morphine served as a buttress of their fantasies of god-like strength or aloofness. Such people tended, for

example, to overwork themselves as part of their conceit; hence the frequency with which overwork was ranked as one of the precipitating causes. In a certain type of sufferer drugs represented not an escape from stress but a desperate attempt to modify the conflicts so as to prevent any gross anti-social behaviour or headlong break into psychosis. He asked whether it was too much to hope that society would signify towards this problem the same greater objectivity of approach as it was doing to the problem of delinquency in the provisions of the Criminal Justice Bill. There was need for legal authority to detain cases for full metabolic as well as psychopathological study—for example, by suitable adaptation of the Habitual Drunkards Act. The chief problem in addiction, in addition to pharmacological readjustment, was to discover with certainty whether this disease depended on special unconscious mechanisms, or whether the use of drugs induced a secondary displacement and alteration of instinct regulation and satisfaction.

Effects of Coercion

Dr. A. E. CARVER said that although drug addiction *per se* was not an offence in law, there were several ways in which strong pressure could be brought to bear upon addicts and the aid of the law directly invoked. Very rarely did an addict submit to treatment unless some such pressure was exercised. At Caldecote Hall, the only institution licensed to receive men under the Act, special opportunity was afforded to study the effect of various types of coercion upon patients simultaneously undergoing treatment. It was found that cases placed in residence there "on probation" did well as a rule, but the preliminary handling of the patient and his relatives by the probation officer was of great importance. Owing to the small number of drug addicts, experience in dealing with them was limited, and special instruction in the matter should be given to probation officers. It could not be hoped to cure all drug addicts, and it would appear useless to attempt to cure by force the deliberately resistant—that is, those who had no intention or wish to readapt themselves. It was well-nigh impossible to treat together in the same institution addicts whose intention was to evade cure and those who consciously wished to overcome their craving. As the result of experience gained, the promise of the patient himself to co-operate in the course of treatment had been made a condition of admission to Caldecote Hall. If only the relatives of an addict were aware of the scope and utility of the probation services they would endeavour to have those services made available to him; as it was, from a mistaken pride, they did all they could to hush the thing up. A survey of attempts to deal with addiction by legal compulsion did not offer much encouragement to the demand for increased powers. Neither public opinion nor medical knowledge was as yet ready for such measures. The indirect powers at present existing would if vigorously employed—as unfortunately they were not—achieve all the good that could at present be hoped for in cases of drug addiction.

Further Discussion

Dr. CRICHTON-MILLER said that from two points of view drug addiction might be regarded as a form of escape—namely, how far it was detrimental to society, and how far detrimental to the individual. There were many other escapes: suicide was one such, and this was punished, when it was unsuccessful, in this country, though in other countries it was merely deplored. Some forms of escape did no obvious harm. The "stabilized" addict was the man who in making his escape from his difficulties had kept relatively near to normality. He suggested that the first approach to the study of addiction must be very strictly in relation to the thing from which the individual was escaping. He referred appreciatively to what the French—a nation of realists—called "family council law," which took into consideration, from the point of view of the possible harm done to the dependants of the offender or victim, not only the drug addict but the alcoholic and the profligate.

Dr. DONALD BLAIR said that the smallness of the number of drug addicts was admitted, and the more considerable problem was alcoholism, which, although it had diminished in recent years, was still prevalent to a very large extent. He was doubtful of the value of psycho-analysis; the treatment took a long time, and only in selected cases was it successful. The special difficulty of dealing with the alcoholic who was without means was constantly present to those who saw those alcoholics who came in and out of the observation ward. In Sweden there were ten State hospitals treating chronic alcoholics. The chronic drunkards were placed in the care of persons qualified to treat their condition, the pivotal agent being a local official appointed by the city council, whose work was that of a clearing-house for the whole alcohol problem in the community.

Dr. MURDO MACKENZIE pleaded for the restriction of the term "drug addiction" to the use of drugs of the morphine type. Dr. Carver had brought up a very important psychiatric principle—namely, the use of the relatives. If relatives would only co-operate in the right way many problems, not only of drug and of alcohol addiction, but of other aspects of medical psychology, would be brought nearer to solution.

In replying on the discussion Dr. RUSSELL BRAIN said that the various remarks had reinforced his view that the drug addict presented a highly specialized and peculiar problem. There were only 700 addicts in this country as compared with some such figure as 100,000 in the United States, undoubtedly because, in this country, it was extremely difficult to get drugs. Apart from doctors and nurses, who had special means of access, what might be called the "lay" addict was nearly always initiated accidentally as the result of having had morphine for some illness, and he could not be said to be psychologically selected, and therefore it was doubtful whether psychological generalizations could be applied to him. He thought the outlook for the treatment of chronic alcoholics had up to now been most disappointing; the outlook for the treatment of drug addicts proper was much more hopeful.

At the meeting of the Society of Public Analysts and Other Analytical Chemists on May 3 three papers were presented and discussed, including one on "Extract of Malt with Cod-liver Oil: Determination of Oil and Vitamin A," by D. C. Garratt, Ph.D. Methods for the determination of oil in extract of malt with cod-liver oil were considered with a view to accurate determination both of the oil and the vitamin A content; those most suitable were critically compared. Full recovery of both oil and vitamin A could be obtained by the Rose-Gottlieb method of extraction of oil provided precautions were taken against oxidation. Little loss of vitamin A occurred in extract of malt with cod-liver oil for some months under normal conditions of storage. "Notes on the Examination of Textiles in Cases of Suspected Dermatitis" were contributed by H. E. Cox, D.Sc. Some recent judgments in the courts made it necessary to consider not only what substances were present but in what quantity and what were the normal contents of such substances. Acidity, sulphur dioxide and chromium, for example, had to be examined quantitatively in relation to the particular type of material, and other metals, too, in relation to their solubility. In the examination of dyed garments alleged to contain this or that intermediate it was particularly necessary to ascertain the nature of the dyes present and their probable constituents so as to recognize what substances were liable to be present and what compounds might interfere with the identification reactions. The application of tests to wool, silk, rayon, and cotton was considered.

Local News

ENGLAND AND WALES

Public Health Congress at Hastings

The Congress of the Royal Institute of Public Health and Hygiene will be held at Hastings from Tuesday, May 23, to Saturday, May 27. The Minister of Health, Dr. Walter Elliot, will deliver his presidential address in the White Rock Pavilion immediately after the official welcome to delegates by the Mayor of Hastings at 3 p.m. on May 23. Discussions have been arranged for the three days May 24, 25, and 26, and each day has been divided into five sections. The following are the principal subjects for discussion: May 24, Section I, nursing reform, miners' health and welfare, and the cancer problem. Section II, puerperal sepsis. Section III, tuberculosis. Section IV, rheumatism and allied diseases. Section V, nutrition and general training. May 25, Section I, Would a General Medical Service benefit the nation? and medical air raid precautions. Section II, infantile paralysis. Section III, tuberculosis. Section IV, the fight against rheumatism: the role of the various authorities. Section V, nutrition in pregnancy. May 26, Section I, cleansing of oysters, foot clinics, report of Abortion Committee, and lead poisoning. Section II, deafness and ear diseases. Section III, tuberculosis. Section IV, rheumatism and allied diseases. Section V, national fitness. Sections I to IV will meet in the White Rock Pavilion and Section V in the Town Hall. Full particulars as to membership fee for the Congress, etc., can be obtained from the secretary, Royal Institute of Public Health and Hygiene, 28, Portland Place, W.1.

The Heritage Craft Schools at Chailey

The annual festival dinner of the Heritage Craft Schools at Chailey in Sussex was held at the Savoy Hotel on May 9. The proceeds of the occasion were devoted to the completion of the appeal for £50,000, which was launched in 1937 and of which exactly one-half has been raised and spent. Of the remainder £13,000 is in the bank and £12,000 is still to be obtained. It is required for the provision at the Boys' Heritage of post-operative and observation and isolation wards, nurses' hostel, out-patient department, and doctors' room. The Bishop of London, the president of the schools, who announced that although he was giving up the bishopric he intended to keep the presidency until the end of his life, proposed, for the twentieth time at these annual gatherings, the health of "The Heritage." He said that he and Mrs. Kimmins, the founder, had seen the project grow from seven little boys housed in a condemned school to a beautiful home of 400 children, with 160 nurses to look after them. He declared that from every point of view Chailey was one of the finest things in the country, turning ailing and helpless children into independent and skilful artisans, assets to the country instead of liabilities. Sir Cyril Norwood voiced the general affection for the Bishop of London, who had been guide, philosopher, and friend to the schools from the beginning. He described Chailey as "the public school of crippledom," where handicapped children were taught never to be beaten but to conquer by enduring and by steady and continued practice. Some of the things which they did seemed to him to be miracles. Sir Edward Villiers spoke of impressions he had gained on paying a visit to the schools. He had gone rather dreading the sight of crippled and tortured little bodies, but instead of that he found the children playing happily in the sun or, with equal happiness, busy at different handicrafts in the workshops, forgetting entirely that they were not normal beings, and, after all, the real normality lay in the spirit rather than in the body. He mentioned the well-equipped therapeutic gymnasium and the peace and humanity of the residential quarters, looking out on some of the most beautiful scenery in England. It was announced that the King had agreed to lend his old home at 145, Piccadilly, for an exhibition of royal treasures, to be opened by Princess Alice in June, for the benefit of the Heritage funds.

Shock Treatment of Schizophrenia

The treatment of schizophrenia by insulin shock is to be extended to three London county mental hospitals and to the Maudsley Hospital for an experimental period of nine months, at the end of which time the position will be reviewed. The treatment was introduced at St. Bernard's Hospital, Southall, in February, 1938, for an experimental period, and it is proposed that it be continued at that hospital as well as at the others mentioned. The total cost of the proposal to the London County Council is £600 for the training of staff and the employment of locumtenents for the medical staff.

First-aid Posts in Essex

General approval has been given by the Minister of Health to the scheme for first-aid posts submitted by the Essex County Council, which as a scheme-making authority under the Air Raid Precautions Act is responsible for proposals embracing over forty constituent districts. Some 105 fixed aid posts and thirty mobile units are included in the scheme as well as a number of first-aid points in rural areas. Full use is to be made of existing medical buildings and facilities. Forty-one of the fixed posts will be at hospitals or public assistance institutions and twenty-three at clinics, health centres, or combined treatment centres. Other posts are to be at suitable halls or public buildings. Only in a few cases have schools been chosen, as the large area of Essex which is in the receiving area under the evacuation scheme has made it essential for schools to be retained for their normal function. At Walthamstow a series of Nissen huts have already been erected as first-aid posts, and it has been decided that adequate first-aid facilities, which could not readily be given in existing buildings, will be provided in these posts. The mobile aid posts are to be stationed at various centres so that immediate help can be given to the rural areas. The first-aid personnel has been allocated generally on a basis of sixty per post in the congested areas and forty per post in the remainder.

IRELAND

Typhoid Fever in Eire

The report for 1937–8 of the Department of Local Government and Public Health, Eire, records a general death rate of 15.29 per thousand. The total number of deaths in 1937 was 45,086, the highest figure since 1924. This is chiefly attributable to the mortality from influenza, which has not been exceeded since the epidemics at the end of the great war. With regard to infectious diseases the incidence of diphtheria continued to decrease, the number of cases reported, 2,511, being the lowest recorded since compulsory notification became operative in all districts. An increase in the incidence of typhoid fever was mainly due to a serious outbreak in a mental hospital. Of the total of 413 cases, the great majority from rural areas, nearly one-third occurred in these institutions. Infection in the mental hospital outbreaks is attributed to "carriers," and the report discusses the problem of their elimination. Prophylactic inoculation, though neither practicable nor necessary as a general measure, is advocated for mental hospitals and for the staffs of fever

hospitals as a valuable preventive measure. In addition it is suggested that all known "carriers" might with advantage be registered by county medical officers and excluded from food-handling occupations. Typhus fever has not yet been completely eradicated, and eight cases with four deaths are recorded. These figures, however, form a striking contrast to those of comparatively recent date. During the decade 1901–10 the annual average number of deaths was sixty; in 1887 the deaths were 309. The cases cited in the report all came from a sparsely populated district in the Caherciveen area of County Kerry. Only four families were affected, and vermin was found in all the infected houses. The source was traced from the first recognized case. The patient's father, aged 80, had died shortly before, following a brief illness, and a near neighbour, aged 75, died about the same time. Neither of these men had been attended by a doctor, and the fatal disease had been labelled "influenza." In all the reported cases, ranging in age from 16 to 75, the Weil-Felix test was positive.

FRANCE

[FROM OUR CORRESPONDENT IN PARIS]

Pity the Private Medical Practitioner!

A member of the French Chamber of Deputies and of the Paris Municipal Council, M. Frédéric Dupont, in an address which is nothing if not outspoken, has taken up the cudgels on behalf of the private medical practitioner. In his opinion the real, if not actually the avowed, enemy of the independent and in many ways most unhappily isolated private practitioner is the Assistance Publique—the body responsible for the administration of huge public sums devoted to the cost of the public hospitals and allied institutions. The Assistance Publique has now, always according to M. Frédéric Dupont, become a State within a State, so self-sufficient that it manufactures its own fittings and furniture and supplies its own food. The medical officers of this body have wished to make their services models of efficiency if not of luxury, and in pursuing this policy they have—unwittingly, it is to be hoped—driven out of existence many a private surgery and private nursing home. For with every step in the upward progress of the public hospitals there has been a new influx of patients who formerly would have considered themselves financially and socially superior to the available public hospital accommodation. The Assistance Publique, in the eyes of M. Dupont, is a monopolistic ogre out to ruin all possible competitors. Hard luck, certainly, on the private practitioner. But those of us who remember what the public hospitals of Paris were like only a generation ago may experience a certain reluctance in deprecating their evolution towards greater comfort and privacy.

Medical Certificates for School Children

Recent discussions between representatives of the medical and teaching professions promise to produce a system of school medical inspection which will meet most, if not all, the objections hitherto raised to it. The family doctor has been concerned over the prospect of a whole-time school medical officer invading what he considers his own province, and doctors in general have been anxious lest the information they put on paper concerning the findings of their examinations of school children should violate that professional secrecy which they so jealously observe. These two snags may be avoided by making the family doctor examine and report on the school children, and by limiting the recorded medical information to data concerning height, weight, girth, etc. There is, however, no enthusiasm among the representatives of the organized medical profession in Paris and the neighbourhood for a health passport destined to follow the school child into adult life and to serve as a disquieting health conscience. For, as the executive committee of the Medical Society of the Seine put it in a resolution adopted early this year, the health passport does not respect professional secrecy, and the records made in it may perpetuate indefinitely diagnostic mistakes.

Blood Transfusion in War-time

The problems of blood transfusion in war have for a considerable time been the subject of discussions within the French Academy of Medicine. When the Academy met last March it adopted the following resolution: "The Academy of Medicine recommends the organization in peace-time of centres entrusted with the preparation of material necessary for the transfusion of conserved human blood. In the event of, and at the time of, mobilization, and in order to avoid all disturbances in the working of this service, these centres should in principle be staffed by a personnel entirely exempt from compulsory military service. The Academy attaches such importance to this organization that it calls for the appointment of a permanent commission charged with the duty of supervising its activities in practice in liaison with the competent authorities."

Correspondence

Chemotherapy of Gas Gangrene

SIR,—In describing the treatment of gas gangrene in your issue of May 13 (p. 989) Mr. Claude Frankau omits any reference to chemotherapy. It is apparently not yet widely enough known that infection by *Cl. welchii* is amenable to treatment with sulphanilamide. Experimental evidence of this is furnished by the work of Long and Bliss (*J. Amer. med. Ass.*, 1937, **109**, 1524; *Canad. med. Ass. J.*, 1937, **37**, 457), and clinical confirmation in a report by Bohlman (*J. Amer. med. Ass.*, 1937, **109**, 254), which describes the successful treatment of three cases of gas gangrene. These patients had severe injuries, due in two to car smashes and in the third to a lift accident; they developed gas gangrene in spite of a prophylactic injection of antitoxic serum, and they recovered during treatment with sulphanilamide, unaided either by further serum treatment or by amputation. Two cases recently treated in this hospital, an account of which will shortly be published, have responded similarly; surgical treatment in both was limited to incision of the affected areas. While much more extensive clinical experience is clearly necessary before the value of this treatment can be truly assessed, I submit that it deserves further trial. In so rapidly progressive an infection the heaviest possible initial doses are indicated.—I am, etc.,

LAWRENCE P. GARROD.

Pathological Department, St. Bartholomew's Hospital, E.C., May 15.

Prevention and Treatment of Shock

SIR,—In Colonel E. M. Cowell's most excellent article on the prevention and treatment of shock (*Journal*, April 29, p. 883) there is, I believe, one notable omission—spinal anaesthesia. Among the references given no mention is made of the epoch-making investigations of O'Shaughnessy and Slome, working at the Buckston Browne Research Farm under the direction of Sir Arthur Keith. Full details of this investigation are given in the *British Journal of Surgery* (1935, **22**, 589), and the previous investigations of Blalock, Cannon, Holt, and

MacDonald, etc., mentioned by Colonel Cowell, are critically discussed. The experiments were carried out on traumatized cats, and the conclusions arrived at apply, therefore, principally to the condition known as traumatic shock, the type of shock with which Colonel Cowell's article is mainly concerned. The investigations undertaken were far too extensive to summarize here, but I will quote three sentences from the conclusions:

"In Experiment 17, despite maximum fluid loss (the largest ever observed in our series of 100 experiments), the onset of shock was delayed for nine hours by the induction of spinal anaesthesia."

"Up to the present, apart from the perfunctory administration of morphine, too little attention has been paid to the nervous side. The one therapeutic measure which succeeded in raising and maintaining the blood pressure of a traumatized cat whose pressure had sunk to 20 mm. Hg was the induction of spinal anaesthesia."

I write on this subject not purely from the book. I have been interested in the therapeutic aspect of spinal anaesthesia for many years, and, coupled with my experience in the last war, I have reached the following conclusions:

1. The medical personnel of all first-aid units should be trained in the giving of spinal anaesthetics, and the correct apparatus for this should be part of every first-aid equipment.
2. Every serious case of injury of the lower limbs should be given a spinal anaesthetic as the first and most important first-aid measure. Thereafter, splintage, restoration of warmth, etc., will naturally follow.
3. Failing a spinal anaesthetic, or where this is inapplicable (for example, in arm injuries), morphine should be given in full doses, again as the first measure of anti-shock treatment.

By these measures I am certain, in the event of war, hundreds of lives will be saved daily, not to speak of the saving of untold suffering. Many will object that a spinal anaesthetic is a most elaborate affair. It need not be. It is purely a matter of practice and having the right needles and syringes. With practice it can be performed with ease and certainty and in a few moments, and it is capable of being given under the most harassing conditions.—I am, etc.,

N. L. M. READER, M.S., F.R.C.S.,
London, S.W.19, May 8. Late Temp. Major, R.A.M.C.

Morphine Injection at First-aid Posts

SIR,—Should an emergency arise first-aid and mobile stations may suddenly find themselves almost overwhelmed by an influx of casualties. The number of skilled workers available at each post is necessarily limited, hence it is essential that all voluntary assistants should be trained to administer morphine by hypodermic injection. Safety and reasonable accuracy of dosage are important; it must be made easy for a relatively unskilled person to measure, and administer rapidly, effective doses of morphine without any risk of accidental overdose, even when working in adverse circumstances and almost, if not quite, in darkness. These requirements rule out the use of ampoules and tablets. The following scheme has been evolved to answer the requirements, and seems suitable for general adoption. It depends on the fact that most Record hypodermic syringes are now graduated in cubic centimetres as well as minims, and, though they vary slightly among themselves, nearly all contain about 1.5 c.cm. when completely filled. Any which fail to conform reasonably closely to this capacity can be rejected.

A solution of morphine tartrate or sulphate containing 1/4 grain in 1 c.cm. (16.2 grammes per litre or 142 grains per pint) is prepared and distributed in rubber-capped bottles, each containing 25–30 c.cm. If a solution of morphine is used containing 1/4 grain in 1 c.cm. the syringe when filled to capacity will contain about 1/3 grain (more accurately 3/8). To administer 1/4 grain the piston is set to the top of the graduated portion (whether the 1 c.cm. mark or 20 minim mark matters very little, for the difference is small). If the syringe is filled completely the dose administered is 1/3 grain or a very little over. Unless more than one injection is given it is impossible to administer a lethal or dangerous dose. First-aid workers and nursing assistants can be instructed to give 1/4 grain to women and 1/3 grain to men. Rapid and accurate measurement of 1/4 grain is facilitated by painting a ring with cellulose paint between the 1 c.cm. and the 20 minim mark, and preferably also by setting the piston at the 1 c.cm. mark and filing a notch in the handle just above the cap. If the latter arrangement is used the notch can be felt with the thumb or finger nail, and with a little practice the syringe can be either filled or set to administer 1/4 grain with considerable accuracy even in darkness.

Pistons of syringes are not interchangeable. Syringes with pistons which leak or are liable to jam are a nuisance. It is most desirable that each syringe should be lettered or numbered on the head of the piston and on the metal nozzle for purposes of identification. Needles should not be too fine, and should preferably be short rather than long. They are then easier to insert into the rubber-capped bottles. If the bottle is always held strictly upright when inverted there is much less likelihood of air entering the syringe if a short needle is used.

In order to avoid danger from the receipt of two doses, those who administer injections should carry labels bearing the word "morphine" in large type, and should be instructed always to tie one of these to the patient before passing on to the next. It is well that a note of the dose and time of administration should be written on the label, but this may not always be possible. If a standard dosage of $\frac{1}{4}$ grain for women and $\frac{1}{3}$ grain for men becomes generally accepted the necessity for such a note disappears. Only where an unusually large dose has been administered is it essential to make a note.—I am, etc.,

London, W.1, May 11. P. HAMILL.

Technique of Blood Transfusion

SIR,—There are certain statements in Dr. Janet Vaughan's lecture, published in your issue of May 6 (p. 933), which suggest that Dr. Vaughan has failed fully to appreciate the details and the advantages of the method of collecting blood for preservation described by us in the *Lancet* of February 18 (not in the *British Medical Journal* as stated by Dr. Vaughan in her list of references).

This method really fulfils more of her conditions than she imagines.

1. We have never preserved blood "under pressure," and we cannot understand that our article could produce the impression that we did.
2. The vacuum in our bottles is sufficient to fill a 600-c.cm. bottle to within 15 c.cm. of its full capacity should it become desirable to do so. As stated in our article, we consider that 3.8 per cent. citrate could be employed in place of "I.H.T. fluid" under war conditions. A 600-c.cm. bottle containing 60 c.cm. of citrate could then be filled almost completely, and we have proved by experiment with preserved blood that a bottle filled to this extent can be subjected to very violent shaking without producing an appreciable amount of haemolysis.

As regards the use of high pressures for the administration of blood, we wish to make clear that in our method the amount of positive pressure employed at the commencement of the transfusion is very slight, being sufficient merely to expel the air from the transfusion tube and initiate the flow. We prefer the use of gravity to any high-pressure method, even when controlled by a

drip-feed. We emphatically disagree with the suggestion that a positive pressure can make it easier to insert a needle into the collapsed vein of a shocked patient and so obviate the need for an incision in such a case. Experience with transfusion in infants has also taught us that once a vein, however small and empty, has been properly entered, a small head of hydrostatic pressure is adequate for any transfusion.—We are, etc.,

C. R. BOLAND.
N. S. CRAIG.
A. L. JACOBS.

London, E.1, May 9.

SIR,—I much regret if I appear to have failed to appreciate to the full the advantages offered by the transfusion method described by Dr. C. R. Boland, Dr. N. S. Craig, and Dr. A. L. Jacobs. I wished to convey that I felt a modification of their excellent method introducing the positive pressure used in the Duran technique might be evolved, and not that their method as it stands at present employed storage under positive pressure. In my own, perhaps limited, experience I have found some degree of pressure, however produced, of advantage in transfusing blood into a collapsed vein.

All discussions of transfusion technique reveal that different operators prefer different methods. It is clear that complete standardization of method cannot yet be obtained, nor is it desirable in the present experimental stage of the use of stored blood that it should.

I must apologize to the authors for giving the reference to their paper incorrectly.—I am, etc.,

London, May 15. JANET M. VAUGHAN.

SIR,—May I recommend the use of the Baxter vacoliter in continuous-drip blood transfusion, a method suggested to me by Dr. J. S. Lawrence.

The vacoliter is sterilized in the autoclave and placed on a stool of convenient height beside the donor. Citrate is injected into it with a syringe. All else that is necessary is a piece of rubber tubing with a large needle at each end. One needle is put into the glass hole of the vacoliter and the other into the donor's vein. The blood is then given to the patient in the same way as an ordinary vacoliter saline. When the blood is finished and it is desired to continue with saline, it is just a matter of changing the vacoliter.

If anyone wishes to store blood this is the obvious method, as the vacoliter is so easily sealed.—I am, etc.,

Worthing, May 10. J. R. GIBBS, F.R.C.S.Ed.

Problems of Dental Caries

SIR,—The article on the above subject by Professor G. F. Taylor and Mr. C. D. Marshall Day in your issue of May 6 (p. 919) is of remarkable interest and importance. Their results appear to disprove effectively the view, long passed into all but complete currency, on the basis of laboratory researches, as to the intimate relation between vitamin D and dental caries. This appears obvious from one of the carefully guarded statements in their conclusions: "From the investigation it is seen that diets deficient in calcium and phosphorus and the fat-soluble vitamins and rich in 'anti-calcifying' cereals do not lead to a greater susceptibility to dental caries under the conditions reported." May I supplement this important statement by reference to a personal experience and record.

Over thirty years ago I, with the co-operation of other nine contributors, carried out an extensive series of researches on diet in the Physiological Laboratory of Edinburgh University, which gave results which have an important bearing on some current beliefs, and incidentally amply confirm the conclusion arrived at by Professor Taylor and Mr. Marshall Day from their recent investigation. In my researches the macroscopical and microscopical examination of the teeth and jaws was carried out by two investigators, skilled dentists who had long been interested in dental microscopy. They reported on a series of serial sections of the complete head of a large number of rats fed on an excessive meat diet, the observations being extended to the second generation of animals. Their report revealed the all but complete absence of any changes in the teeth that could be attributed to the diet. Their findings are summarized in the following statement. "A striking feature in our observations was the extreme softness of the bones of the jaws in the meat-fed animals, and in view of the alterations in the bones it is of interest to note the relatively normal condition of the teeth."[1] Relevant to this the changes in the osseous system were described by another investigator (Dr. Dingwall Fordyce), who found, *inter alia*, "general softness of the whole osseous system, increased vascularity, bead-like prominences at costo-chondral junctions, and curvatures of the spine and long bones."

It is of interest to note that many years ago, after some present erroneous views had been firmly established, and therapy based on their assumed correctness became *de rigueur*, I discussed the significance of these findings with a distinguished researcher who was a firm believer in the current faith. The only explanation offered for the divergence in the results was that of "faulty observation" by the two observers mentioned. Leaving this point aside, there will be, I think, wide concurrence with the view that more care and caution should be paid in seeking to apply the results of much modern research to the elucidation of the many big unsolved problems which confront the profession to-day. If we continue assiduously on the too narrow lines and outlook now prevailing, it is not improbable that a hundred years after this our successors will discover that we have been a little unwisely barking up the wrong tree.—I am, etc.,

Drem, N.B., May 7. CHALMERS WATSON, M.D.

SIR,—The abysmal aspect of the controversies that have characterized dental and medical literature on dental caries is only deepened by the contribution on that subject by Professor G. F. Taylor and Mr. C. D. Marshall Day directed against the deficiency-diet doctrine (*Journal*, May 6, p. 919). There is no likelihood that these writers will throw any light on the problem, nor have they discovered anything new. One hundred and sixty-eight years ago John Hunter, speaking of the teeth, says: "They never change by age, and seem never to undergo any alteration when completely formed. . . . Thus in children affected with the rickets, the teeth grow equally well as in health, though all the other bones are much affected; hence the teeth being of a larger size in proportion to other parts their mouths are protuberant." In a short article in the October issue of the *Glasgow Medical Journal* (1933)—"The Cause and Prevention of Dental Caries (with Dr. John Hunter's Contribution thereon)"—I show how he recoiled from all doctrines, whether associated with the blood supply or menstrua, about the teeth; for which conclusion he gives pointed and just reasons. I take up the problem where he in a negative manner leaves it in that article. If anyone reads it they will understand why I write this letter.—I am, etc.,

Glasgow, May 10. WILLIAM WALLACE.

[1] *J. Physiol.*, 1906, **34**, 111.

Medical "Testament" on Nutrition

SIR,—The wit of Dr. Richard R. Bomford's quoted joke on compost-minded and compos mentis (May 13, p. 1004) merits a large-scale answer. The great peoples of the Orient—the Chinese and the Japanese—have for centuries been compost-minded and have also enjoyed long periods of peace unknown to the contemporary West. The great country from which Dr. Bomford writes is even less compost-minded than we are, and is, according to well-known authorities, on the way to becoming a desert unless its alarmed efforts to avert this danger are enlarged until "everybody ceases to be an exploiter and becomes a conserver of the soil" (R. O. Whyte). Whether it is possible to be at one time compost-minded and compos mentis, or the second includes the first, I leave to your readers.—I am, etc.,

Caversham, May 15. G. T. WRENCH.

Stilboestrol

SIR,—Much evidence has been obtained of the beneficial effect of stilboestrol on the gynaecological symptoms of the menopausal syndrome, but the following case testifies to the dramatic effect on the psychological and nervous symptoms also.

On May 5 I was called to a woman of 54 who had attempted suicide by gas poisoning. She was unconscious and nearly pulseless, but fresh air and artificial respiration brought her round. She then became very restless, remorseful, and agitated, requiring morphine, and I consented at her own urgent request to send her as soon as possible to the local mental hospital as a voluntary patient. I now obtained a history that she had suffered from severe nervous and vasomotor symptoms, including hot flushes of a most distressing character, during the last two years. In view of this I decided to give stilboestrol, 1 mg. three times a day. The effect after only three doses was indeed dramatic. The hot flushes ceased and the mental condition completely altered. She expressed herself as "feeling a new woman"; all remorse at her attempted suicide had disappeared, and she begged me not to have her "put away." She had passed from a condition of agitated melancholia to the appearance of comfortable well-being within a few hours.

—I am, etc.,

Pembroke Dock, May 8. RUFUS P. REES.

Test for Blood Oestrone

SIR,—Dr. Frederic Sanders (*Journal*, April 1, p. 693) asks for protection from the "endocrine orchestra" and seeks a simple test for blood oestrone. I should like to call attention to an article by Dr. Evan Shute of Ontario, Canada: "Determination of the Oestrogenic Substance in Blood Serum by Means of an Estimation of the Anti-proteolytic Power of the Serum" (*Amer. J. Obstet. Gynec.*, 1938, **35**, 970).

We have found this test to be a reliable index of the oestrone content of the blood, highly suitable for all practical diagnostic and clinical purposes. Aside from its reliability is the simplicity of performance. The procedure requires no special apparatus or expensive instruments—it can be performed with the material on hand in the average laboratory. Another article, "The Diagnosis and Treatment of the Common Disorders of Menstruation," by the same author (*Canad. med. Ass. J.*, 1939, **40**, 38), has a short opening paragraph which bears quotation:

"Practitioners everywhere are besieged by the vendors of the different hormonal preparations which are recommended for the abnormalities of menstruation. We should have some rational method of diagnosing part or all of the hormonal situation in these clinical conditions, since diagnosis must precede any proper therapy, whether it be endocrine, surgical, or a combination of the two."

—I am, etc.,

Los Angeles, California, April 24. WILLIAM COOPER.

Explosion of Anaesthetic Vapours

SIR,—In reply to Mr. Lionel Colledge and Dr. Charles F. Hadfield's letter, which appeared in the *Journal* of March 11 (p. 533), concerning explosion of anaesthetic vapours, I feel that the following instance is worth reporting.

During an operation for the repair of a cleft palate of a patient under ether anaesthesia and at which a movable suction apparatus was being used, an explosion took place in the compartment in which a stud rheostat and the motor and pump were housed. The explosion was of sufficient violence to tear off a three-quarter-inch wooden panel fixed to the iron framework of the container by eight stout screws, and to dent in a 10-c.cm. Record syringe metal box to the depth of half an inch. This was lying on the top of the "sucker" box and was hurled against the edge of an instrument cabinet. The suction in this machine is provided by a piano-player apparatus made up of four bellows driven by an electric motor, and is controlled by a stud rheostat placed on the inside of the front wall of the box, which has metal sides and a wooden top. The suction is taken in the first place through a glass receiver which stands beneath the operating table, and then by way of a hose-pipe 14 feet long through a metal reservoir of about one cubic foot capacity, which lies under the case. The exhausts open into the case through the valves on each of the four bellows and there is an escape to the outside air by vent holes. The only conclusion as to the cause of the explosion that my anaesthetist and I were able to arrive at was that ether was sucked from the mouth and discharged into the case holding the apparatus and that a spark, either from the motor or from the rheostat, exploded the mixture.

In the operating theatre in which I work I use two of these machines as separate units, and frequently, when independent suction is needed, the two of them are in action at the same time. Although I have used this form of suction apparatus for about fourteen years this is the first occasion on which anything of this nature has occurred. Incidentally, while reporting this happening I would like to say that this form of suction as a separate unit is the most satisfactory one that I have knowledge of and it has a power that is seldom equalled, let alone surpassed, by the usual suction apparatus on the market.

—I am, etc.,

Brisbane, April 27. R. GRAHAM BROWN, F.R.A.C.S.

Chronic Mastitis

SIR,—I was amazed to read Dr. Alfred C. Jordan's observations on chronic mastitis in the *Journal* of May 6 (p. 951), in which he relates the occurrence of chronic mastitis in "toxic" patients as a result of intestinal stasis. Undoubtedly one must keep a completely open mind on a subject such as chronic mastitis, where the aetiology is so equivocal, but it does seem absurd to say that the changes of cystic mastitis can be due to "intestinal stasis."

The question of "intestinal stasis" is one around which a storm of opinion has raged in the past, and yet I think it would be fair to say that at the present time the general consensus is that the condition rarely gives rise to toxic symptoms. It is agreed in the best colonic and rectal circles that constipation bears no relation to the incidence of colonic and rectal cancer, and yet we are now

asked to believe that constipation can give rise to cancer in so distant an organ as the breast.

Rational clinicians generally consider the presence of cysts in chronic mastitis to be a definite indication for radical treatment, as experience shows that such breasts are far more likely to undergo malignant change (if indeed such change has not already occurred) than the finely nodular variety without cysts. Dr. Jordan apparently attributes cyst formation to "leucocytic nodules and distension of alveoli." Such a description is thoroughly vague. Authoritative persons have shown us that cyst formation is for the most part due to duct blockage by proliferated epithelium, and that possibly periductal fibrosis also plays a part; I really fail to see how "leucocytic infiltration" in a "toxic" patient can give rise to cysts.

Possibly I have been brought up in a less "colon-conscious" school than Dr. Jordan, but just because large numbers of women are constipated and certain numbers of these have nodular breasts and other "toxic" symptoms seems to me pretty poor evidence that chronic mastitis is due to "toxaemia."—I am, etc.,

London, S.W.17, May 7. REGINALD S. MURLEY.

Certificate in Orthopaedic Nursing

SIR,—Reference was made to a certificate in orthopaedic nursing in the course of a review of Miss Evelyn C. Pearce's *A Textbook of Orthopaedic Nursing* in the *Journal* of April 22 (p. 829). As this certificate is sponsored by the Central Council for the Care of Cripples, may I be allowed to draw attention to an alteration in policy with regard to its award, designed to meet the criticism of which mention is made in the review.

In future, probationers on passing the examination will be given a statement to the effect that they have done so, but the certificate itself will only be awarded to those who subsequently qualify by becoming State-registered nurses in the general part of the Register, or members of the Chartered Society of Massage and Medical Gymnastics, or, of course, to any who are already qualified when they take the examination. The new arrangement will apply to all who enter for the examination for the first time in November, 1939.—I am, etc.,

R. C. ELMSLIE,
London, S.W.1, May 9. Chairman of Executive Committee.

Admission to Hospital

SIR,—I beg to differ from the opinions of "Specialist" published in the *Journal* of April 29 (p. 900). I am medical superintendent of a council hospital, and therefore have some experience of the subject which "Specialist" mentions in his letter.

In our locality (which I prefer not to mention, for obvious reasons) I have been told by more than one practitioner that a patient of his could not be admitted to the local voluntary hospital without having a member of the honorary staff in consultation, at a minimum fee of three guineas. "Specialist's" patient's views were *not* erroneous. Again, if a patient is attending an out-patient department, surely he or she is entitled to consult a specialist privately on payment of the usual fee? And further, that specialist is entitled to ask for the patient's admission to hospital if he considers it necessary?

Admission to hospital is not "determined by clinical considerations alone." We in the hospital service know, and know only too well, that admissions have on occasion to be arranged for domestic reasons—sometimes the clinical reason being quite in the background. We in the municipal service could quote various cases where the voluntary hospitals should have admitted cases which they have transferred to the municipal hospital. I can give examples (I know this is irrelevant to "Specialist's" remarks, but it is so). In my opinion, if a voluntary hospital undertakes the treatment of a patient as an out-patient, and that patient eventually requires treatment as an in-patient, the patient should be admitted to that hospital, and not be "shelved" on to people who already have more than enough to do and are frequently understaffed.

I have expressed myself rather freely, Sir, but I feel strongly upon this subject.—I am, etc.,

May 8. M. S.

Treatment of Fractures

SIR,—May one of the "men with high degrees" who is in charge of a newly formed fracture service make some comments on Dr. A. Henry Gregson's letter (*Journal*, May 6, p. 949). His criticism is of the incompletely trained traumatic surgeon and his plea for more co-ordinated and practical training.

As one who is personally acquainted with the majority of the "hyperspecialized surgeons" with "only one criterion—higher surgical degrees or diplomas," who have been appointed to the newly created fracture services of Great Britain in the last few years, I feel that a more accurate statement of facts is required. The modern orthopaedic surgeon has had a thorough theoretical training and a good practical experience of general surgery, and an extended theoretical and intense practical drilling in both traumatic and pure orthopaedic surgery. It is common for him to have studied his specialty away from his "home town." His teachers are able to discuss the merits of various schools of thought. He has been encouraged to spend time at several centres, in many cases outside this country as well as inside. He has had to give practical demonstration of his ability to treat a fracture as well as talk about it. In the place of this supervised, controlled training Dr. Gregson speaks of the "advantage" the junior house-surgeon receives from a multiplicity of "advice coming from many schools of thought, from which, if only he *experiments long enough*, he could evolve his own particular system" (my italics). True, but what a waste of time and effort! And the patients for whom Dr. Gregson shows his concern later in the letter—do they benefit during this "experimental" period?

The committees of our hospitals know full well that the mere possession of a higher degree is not a guarantee of ability. Dr. Gregson is apparently unaware that inquiries are frequently made about likely men even before a new service is finally agreed on. And the chief question asked is not "What are his degrees?" but "Is he any good? Can we be sure that he is capable of holding down the proposed post?" And may I add that there is a great deal of loose talk about schools of thought and the advantage of this or that method of treatment. Many fractures can be treated by anyone of an average intelligence and ability. A good house-surgeon can be trained to do it in six months. But the first step in treatment is diagnosis. That is why we must have an expert who has had the necessary long experience to make him fully *au fait* with every type of fracture. All suspected cases must pass through his hands in order that nothing shall be missed. The next step is to determine what form of treatment shall be carried out. And no one of us is, I hope, so hidebound that he cannot see good in several methods, or that he will prohibit a promising house-surgeon from using something different from usual so long

as it conforms to principle. He controls it by the check-up of *x*-rays and regular inspection, and can at any time step in if things are not going well. I speak subject to correction, but I do not believe that any of us who are in charge of fracture services asserts that the method he uses is the best method. We have our preferences. We vary our method to suit varying fractures and the condition of the patient. And we know from long experience that the method we use is the best in our hands, or that subject to local conditions and financial state it is the most satisfactory method in that hospital.

The one real difficulty about orthopaedic surgery was not mentioned. It has grown too big. It has become impossible to know everything about fractures and bone tumours and bone and joint tuberculosis and scoliosis, and all the other almost innumerable conditions we have to deal with. And its very size and the subtle differences of treatment and the outlook required by the surgeon have resulted in the orthopaedic department of some hospitals being devoted mostly to traumatic surgery, while others treat chiefly pure orthopaedic conditions. A division into two groups is essential—traumatic surgery and pure orthopaedics. I may be severely castigated for saying this. But it is noteworthy that the majority of my colleagues with whom I have discussed the subject are in complete agreement. If the division eventuates there will still be the common training, just as every medical student receives a common training whatever he intends to do when qualified, but in addition there will be further apprenticeship to one or other of the two subdivisions if the standard of which we are so proud is to be maintained.—I am, etc.,

Manchester, May 9. W. SAYLE CREER.

Toxicity of M & B 693

SIR,—We were greatly interested in Mr. A. J. Ewins's letter (*Journal*, April 8, p. 749) in which he claimed that the oral administration of M & B 693 (sulfapyridine) to mice, rats, rabbits, cats, and dogs, in either small or massive doses, singly or repeatedly over a period of weeks, produced no untoward results. We should like to call attention to our finding of urinary calculi composed of 6.4 per cent. sulfapyridine and 64.1 per cent. acetylsulfapyridine in a number of rats which received 0.5 to 1 gramme per kilo of M & B 693 each day orally for eight to fourteen days (*Proc. Soc. exper. Biol. Med.*, 1939, **40**, 448). The resulting sequelae were in many instances partial to complete urinary obstruction with associated pyelonephritis and haematuria, and sometimes death. A more detailed report will appear in the *Urologic and Cutaneous Review*. Antopol and Robinson (*Proc. Soc. exper. Biol. Med.*, 1939, **40**, 428) simultaneously reported that similar calculi were caused by administering M & B 693 to rats, rabbits, and monkeys, but were not produced in mice or dogs.

The failure of Wien, quoted by Whitby (*Lancet*, 1938, **1**, 1210), to observe urinary calculi in rats which received as much as 3 grammes per kilo for fifteen days is difficult to explain in light of these results. Although the formation of urinary calculi following the administration of M & B 693 to certain experimental animals is not exactly a "toxic" reaction, it deserves the serious attention of clinicians, since haematuria following therapy with M & B 693 has already been reported by Adalja (*Journal*, March 25, p. 643); and since other instances have been brought to our attention.—We are, etc.,

PAUL GROSS.
FRANK B. COOPER.

Western Pennsylvania Hospital, April 27.

Medical Inspection for Superannuation Benefit and the Incidence of Deafness

SIR,—Social reforms on behalf of the deaf have been delayed largely because it has been difficult to obtain a reliable estimate of the number of such people. It has been brought to my notice that there is a present opportunity of obtaining information on this point because some municipal authorities are starting superannuation schemes for their employees and are arranging preliminary medical examinations. The time available for the examination is usually short, so that it is not practicable to suggest that exact tests of hearing should be made on each applicant. But useful data would be obtained if a questionnaire could be filled in. A suitable form is appended, duplicated copies of which can be obtained from me. I should also be interested to receive completed sheets for statistical analysis.

NAME ..... AGE ..... WORK .....

Please answer the following questions with Yes or No
(There is no hurry; if you do not understand what is meant ask for an explanation.)

1. Do you consider that your hearing is perfect in both ears? ... ...
2. Do you consider your hearing to be perfect in one ear only? ... ...
   If so, which is the better, the left ear? ... .
   or the right ear? ... .

Answer the following questions with regard to the better ear if your ears are not equally good

3. Do you find it difficult to hear at the cinema? .....
4. Do you find it difficult to hear when several people are talking together?... ... ...
5. Do you find it difficult to hear one person if he is talking to you in an ordinary voice? .....
6. Do you find it difficult to hear one person even if he speaks loudly? ... ...
7. Do people have to shout in your ear to make you hear? ... ...
8. Can you hear your own voice? ... ...
9. Can you hear the noise of traffic in the street? .....

RESULT OF EXAMINATION OF EAR. (This part of the form will be filled in by the Doctor.)

	Wax	Tympanic Membrane	Special Notes
Right Ear			
Left Ear			

(If the patient uses a hearing aid the questionnaire should be answered twice—firstly with regard to his natural hearing, and secondly as to what he can hear with the instrument.)

It is hoped that whenever possible the examining doctor would inspect the ear with an auriscope as well as take a medical history in cases of defective hearing. This would indicate how many of the cases of deafness might be attributable to wax, and also give some idea as to what proportion of them were due to middle-ear disease, which should be preventable.

I am authorized to say that the matter has the interest of the Medical Committee of the National Institute for the Deaf, and of the Hearing Committee of the Medical Research Council, of which I am a joint secretary.—I am, etc.,

PHYLLIS M. TOOKEY KERRIDGE, Ph.D., M.R.C.P.

University College, London, W.C.1,
May 10.

Tuberculosis in Industry

SIR,—Under the heading "Dust Diseases of the Lung" (*Journal*, May 6, p. 945) you reported an address given by Dr. Philip Ellman to the Advisory Medical Committee of the Industrial Welfare Society. Dr. Ellman is reported to have stated that "as a preventive measure all large factories should have on their staff a medical officer with adequate facilities, including *x*-ray apparatus." To the first part of this statement no exception can be taken, but to state that every large factory should be equipped with *x*-ray apparatus for the purpose of detecting early tubercle suggests that Dr. Ellman does not fully appreciate the proper sphere of industrial medical services.

If any industrial medical officer set up a system of examination and equipment specifically to detect the early stages of pulmonary tuberculosis, a disease which cannot be regarded as occupational, he would needlessly be overlapping our present health services. Only in exceptional cases can the cost of an *x*-ray apparatus for chest work be substantiated by an industrial medical officer—for example, where there is a specific occupational lung hazard, or in the rare instances where no *x*-ray facilities are available at all in the locality. A very proper place in the prevention and detection of tuberculosis does, however, belong to the industrial medical officer in that he can refer to the right quarter many doubtful cases of vague ill-health reported from the factory, and can also assist in the safe rehabilitation of suitable ex-tuberculous patients under proper control. But *x*-ray and specialist diagnosis of such a disease is not either within his competence or proper sphere.

With the policy of extension of medical services in the factory one cannot but be in agreement, but needless expenditure and uneconomic and irrational development, on the lines, for example, as are here indicated, can do nothing more than antagonize the employer, who already is contributing financially to the health services of the community by national health insurance and hospital contributions, and who feels, reasonably enough, that the specialist detection of a disease such as tuberculosis is outside the sphere of industry.—I am, etc.,

Birmingham, May 10. D. STEWART.

Sterilization of Dressings

SIR,—In connexion with the recent discussion on sterilization of dressings, it may be of interest to recount the technique employed as long ago as 1906 at the Egyptian Government's quarantine station at El Tor, on the shore of the Red Sea, in Southern Sinai, for pilgrims returning to Egypt, North Africa, Europe, Asiatic Russia, and Turkey from the Hejâz. The method and organization were devised by the late Sir Armand Ruffer, President of the Maritime Sanitary and Quarantine Council of Egypt.

The methods employed were as follows:

The disinfecting station was divided by a partition wall, running athwart the sterilizers and so dividing it into a dirty and a clean side, between which there was no communication except through the interior of the sterilizers. These machines were—so far as my memory goes—by the French maker DeHaitre, and consisted of very large horizontal autoclaves, with steam jackets and kymographic recording indicators giving a permanent graph of time and pressure. These instruments were fitted to each autoclave in glass cases (protected by a wire cage) with padlocks, of which the medical officer in charge alone had the key. As the pilgrims came in they were stripped of their clothes and also all their personal belongings, which were put into nets—closed by a purse-string suture which was clamped by a numbered leaden seal. A duplicate number was hung round the pilgrim's neck. While the pilgrim went through the bathing place, in which hot and cold showers were fitted, he was thoroughly soaped and scrubbed; such of his clothing as would not be spoilt by steam was then, in the sealed nets, placed loosely in the autoclave on a truck on wheels, which fitted into the machine.

The technique of the sterilizing process was: (1) The outer jackets were filled with steam. (2) The interior was then filled with steam at 120° C. for ten minutes. (3) Steam was released from the jackets and from the interior to atmospheric level, no air being allowed to enter, thus inducing a vacuum in the autoclaves. (4) The jackets were again filled and steam introduced into the autoclave for another ten minutes at 120° C. (5) Steam was again released from the jackets and interior as above. (6) Steam was reintroduced into the jackets and into the interior at 120° C. for twenty minutes. (7) Steam was released from the interior, keeping the jackets hot, the autoclave door on the clean side opened, and the clothes allowed to dry, the drying being afterwards completed in the sun.

A similar method was used for the sterilization of dressings, which were loosely packed in bags (usually made, if I remember rightly, of *damûr* or Sudanese cotton cloth). These were placed loosely in ordinary enamelled iron buckets, provided with lids which were left off in the sterilizer, being replaced and sealed, of course, when the buckets were taken out.

As one of the pathologists attached to the station it was my duty to test all the sterilizers before the opening of each pilgrimage "campaign" and periodically during it. I did this by placing cultures of different bacteria and tubes of horse manure in the centre of the clothing to be disinfected, under conditions approximating as nearly as possible to those of the actual working. It was always emphasized that no tight packing of any sort was to be employed and nothing enclosed in tins or other closed receptacles. At the same time I used to place in various parts of the clothing, etc., small sealed thin glass tubes containing flowers of sulphur, which melts at 114.5° C. It is easy to tell whether the sulphur has melted or not, because melted sulphur changes its colour and leaves a red stain in the tubes. The cultures were then subcultured, aerobically and anaerobically, in the usual way and tested for growth. It was quite the exception to get any but melted sulphur tubes and sterilized cultures, and I found that the cultures were invariably sterilized where the sulphur tube had been subjected to a temperature above its melting point. Any unsatisfactory result, of course, was at once rectified. The sulphur tube, therefore, appears to be a reliable indicator where bacteriological facilities are not available, provided that the question of adequate penetration of the steam and exhaustion of the air be not in doubt.

Many of the pilgrims as they arrived at El Tor were suffering from dysentery, cholera, plague, and other epidemic diseases; their clothing was often verminous and befouled with the dejecta of dysentery and (in epidemic times) of cholera. Small-pox was prevalent and typhus common in the Hejâz, but I do not remember ever seeing a case of either develop at El Tor after an incubation period denoting prior infection. As we are dealing only with clothing I need not mention the methods used for the bacteriological examination and general survey of the pilgrims' persons, except to say that this side of the problem was not overlooked, and was the subject of more care than was their clothing.

This method of sterilization seemed to work so well that I cannot help thinking that even in England to-day there may be places where, and times when, it could usefully be adopted. It would certainly seem to be applicable, not only for sterilization but also for use in decontamination centres, where possibly large quantities of "gas"-contaminated clothing may have to be handled and where its value would render incineration undesirable.—I am, etc.,

Fleet, Hants, May 12. J. GRAHAM WILLMORE.

Sterilization of Syringes

SIR,—I am surprised that the method of syringe sterilization seems to be so much a subject for debate. Surely sterilization by boiling is the easiest method open to the general practitioner. In my own practice it is the custom for the office peon to take my syringes out of my case each morning when I arrive in my consulting-rooms and place them in an electric sterilizer, which is kept constantly on the boil during consulting hours. When they are wanted they are lifted out, allowed to cool, used, washed, and put back into the sterilizer. If the syringe has been used for oily solutions, such as progynon or proluton, it is rinsed out with ether before being put back in the sterilizer. I have never had an injection abscess, even with intramuscular injections of quinine, which are notorious for causing abscesses. Is there any great objection to boiling a syringe before use? With the cheaper form of Record syringe the cement may give way, but I have not had that mishap with the original Record. The all-glass syringes are apt to become inefficient after many boilings—that is, six hours a day boiling for six months. I find that the piston becomes loose in the barrel, and the solution for injection is apt to seep back when pressure is applied to the piston. Surely a new syringe every six months is a small price to pay for absolute sterility? No reasonable doctor would use one syringe, say a 10-c.cm. one, for aspiration of an abscess and ten minutes later use it for an injection of N.A.B. If one has to use a syringe for aspiration of pus it should not be used for an injection till it has been boiled for several hours.

If these few elementary precautions are observed I see no reason why one should ever begin the very trying and undignified process of having to explain away the presence of a localized abscess at the seat of injection, or, worse still, having to explain to the relatives how the patient got septicaemia following a simple injection. If I have missed some important point with regard to syringe sterilization I hope some of my colleagues will write and enlighten me. If not, I hope that my procedure will be adopted more generally. Personally, if I developed an injection abscess after an injection by a colleague I should be most annoyed.—I am, etc.,

Kuala Lumpur, F.M.S., May 6. I. GORDON CAMERON.

Misguided Efforts at Abortion

SIR,—Three years ago I had the opportunity of treating a case similar to those described by Mr. R. L. Dodds and Miss M. H. Mayeur in their article on misguided efforts at abortion in the *Journal* of May 6 (p. 921).

The patient passed a piece of elm bark into her bladder in attempting to produce an abortion. She was admitted to hospital a few days after the event. The strip of bark was very obvious on cystoscopy, but there was no inflammation of the bladder. The only difference in the treatment employed was that I used spinal anaesthesia in order to obtain maximum relaxation of the urethra. The urethra was dilated with Hegar's dilators to admit the index finger. The strip of bark was easily palpated, manipulated towards the internal urethral orifice, and hooked down alongside the finger by the terminal phalanx. It measured 2 inches by ½ inch, but the urethra was so distensible that there was no laceration of the mucosa. No indwelling catheter was used. She passed urine the same evening without difficulty, and there was no incontinence. She had no further trouble with micturition.

I was particularly interested in this article as, although the complication must be fairly common, I had not previously seen the method described.—I am, etc.,

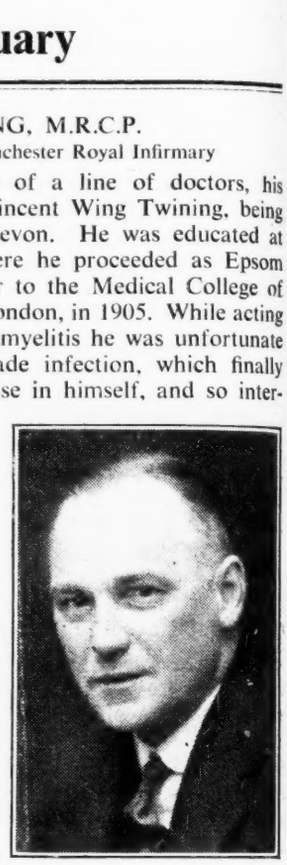
Shrewsbury, May 8. D. LINCOLN LEWIS.

Obituary

E. W. TWINING, M.R.C.P.

Honorary Radiologist, Manchester Royal Infirmary

Edward Wing Twining came of a line of doctors, his grandfather and his father, Vincent Wing Twining, being in practice at Salcombe in Devon. He was educated at Epsom College, and from there he proceeded as Epsom Scholar and Carr Exhibitioner to the Medical College of University College Hospital, London, in 1905. While acting as a dresser to a case of osteomyelitis he was unfortunate enough to contract a low-grade infection, which finally developed into the same disease in himself, and so interrupted his work that he was unable to qualify until 1913. After a short experience in general practice he returned to London and held appointments as resident medical officer at Queen Mary's Hospital for Women and Children and as house-surgeon and later obstetrical and gynaecological assistant at University College Hospital. He was rejected for general service in 1915 on medical grounds, but served under the British Red Cross as surgeon to No. 17 Ambulance Train in France, and in the following year was attached to the British Red Cross Hospital at Netley. From then onwards he devoted himself exclusively to the study and practice of radiology and electrotherapeutics.



In 1916 he took charge of the electrotherapeutic and physiotherapeutic departments at Netley, where, with the honorary rank of Captain R.A.M.C., he remained until the end of the war. During this period he gained a considerable and varied experience in physical methods of treatment. He was particularly interested in special investigations of the treatment of injuries to peripheral nerves, and in collaboration with H. S. Souttar published a paper on this subject in the *British Journal of Surgery*. This communication was later enlarged and appeared in book form. After the war Twining was appointed radiologist and radiotherapist to the Ministry of Pensions Hospital at Netley, and retained that post until 1922, when he resigned in order to study in the *x*-ray departments of St. Thomas's and other London hospitals for the Cambridge Diploma in Radiology. In taking this diploma in 1923 his keenness, thoroughness, persistence, and judgment so impressed one of the examiners that he determined to get him to Manchester. This was brought about by the generosity of an anonymous friend of the hospital, which made it possible to offer a salary for research in deep *x*-ray therapy. He was appointed to do this, and at the same time became junior assistant to the radiological department, and at a later date was taken into partnership in a consulting radiological practice in the town. Experienced visitors from over-seas who saw him at this research work expressed their opinion that he was one of the best of the younger radiologists that they had met, and time has shown that they were not in error. In 1926 he was appointed honorary radiologist to Ancoats Hospital, and two years later assistant honorary radiologist to Manchester Royal Infirmary.

His mind was continuously being applied to the improvement of *x*-ray technique and to the devising of more accurate and cheaper methods. Ideas which he himself was unable to work out in detail will be followed up by his fellow workers, who knew his intentions. His clarity of thought, his gift for simplification, and his mechanical ingenuity were well shown in work on tomography. The original apparatus was almost prohibitively expensive, but Twining invented a simple attachment for enabling the method to be carried out on any *x*-ray couch of the usual pattern. He described this in an article entitled "Tomography by Means of a Simple Attachment to the Potter-Bucky Couch" in the *British Journal of Radiology* (1936, **10**, 332). In this paper he dealt with the use of tomography in investigating diseases of the chest, which he thought would be its chief field, but he foresaw its possible value in the radiological investigation of the spine and skull and in ventriculography. Some important original work of his on the radiology of the third and fourth ventricles was in the press at the time of his death.

When the Christie Hospital and Holt Radium Institute was being rebuilt Twining was invited to become its honorary radiologist and to advise the Board on the layout of the *x*-ray department, and afterwards on the purchase of new types of tubes at voltages of up to half a million. He also arranged the department for clinical photography, and was given a free hand in the purchase of the instruments for it. The diagnostic *x*-ray work at the Christie was under his supervision, and he would often examine some of the more obscure cases himself. In 1936 he delivered a Hunterian Lecture at the Royal College of Surgeons on a radiological study of the third ventricle. In it he described ventriculographic methods with special reference to posture. The routine position which he used was obtained by extending the patient's head as far as possible, and at the same time tilting the head of the couch downwards at an angle of about 30 degrees until the orbito-meatal line was horizontal. This method gave a very satisfactory filling of the third ventricle, even with a small amount of air. Twining was one of the first, if not the very first, to solve the problem of radiography of the third ventricle, and he could make a small bubble of air provide as much information as others obtained after a complete air replacement. In preparation for this lecture he went to the Infirmary for two hours or so every Monday night for nine months with neurological friends discussing and working at the problem. In the same year he took part in a discussion at the Royal Society of Medicine on the value of radiology in neurosurgery. Not only, he said, were surgeons asking for more examination by its means, but they also wished for more critical and careful work and improved technique. The surgeon played a leading part by providing the material and systematizing the evidence to help the investigation, and in such close collaboration increased the "visual acuity" of the radiologist. A paper of his on the interpretation of radiographs of the alimentary tract, which also appeared in 1936, was one of the series of articles on "Treatment in General Practice" published in this *Journal*.

In the forty years since Karl Roentgen amazed the scientific world by showing a photograph of the bones of his wife's hand with a ring on one finger, which he had taken by his new *x* rays, diagnostic radiology has become an increasingly complex specialty, and it is difficult for one person to be equally expert in all its branches. Present-day knowledge is being recorded in *A Textbook of X-ray Diagnosis* in three volumes, two of which appeared last year, edited by Dr. Twining and Dr. F. Cochrane Shanks and Dr. P. Kerley of London, with fifteen British collaborators. Dr. Twining's share of it was the section dealing with the respiratory system in Volume I. It occupies three-fifths of the 500 pages, and is illustrated by 245 of his own radiographs and anatomical drawings, in the making of which he had considerable skill. Although he was especially interested in the radiology of the chest, he had a very extensive experience of all its other applications, and his opinion on any case examined by him was highly valued by his colleagues. Twining was possessed of considerable artistic talent, and spent his vacations in drawing landscapes in water colours, some of which were shown at the exhibitions in London of the Medical Art Society, of which he was a member. He was invited by the Board of the Christie Hospital to use these talents in devising a colour scheme for the decoration of the extensive out-patient department of the new hospital. He was a lecturer in radiology in the University of Manchester, and one much appreciated in the undergraduate and postgraduate courses. He had been chosen as president of the Section of Radiology of the Royal Society of Medicine and of the Faculty of Radiologists, in the foundation of which he had taken active part. At the Annual Meeting of the British Medical Association in Manchester in 1929 he was secretary of the Section of Radiology and Radiotherapeutics, and at the Belfast Meeting two years ago he was a vice-president of this Section.

Everyone who was associated with Twining had the greatest respect for his high abilities and personal characteristics, and for his uncomplaining endurance under great physical disability and, at times, pain. There was a feeling of brotherly affection for him among all his colleagues, and the impressive memorial service in the chapel of the Royal Infirmary was like a large family gathering.

Mr. Geoffrey Jefferson writes:

Sudden death always creates a feeling of incredulity as well as of sorrow, a reaction that varies according, on the one hand, to the purely intellectual gifts of the man, and, on the other, to the more affective qualities that he possessed. What is so tragic about Twining's death is that he has gone at the very height of his powers, with so much that he still wanted to do. That is what he would say himself. He would not be able to appreciate so well as we how much he had already done. No thinker ever realizes fully his own accomplishments, and Twining was essentially a thinker, though of the most practical kind imaginable. He was too modest to realize as well as we how unusual he was. While he was in charge of a radiological department there was no risk of its being regarded as a purely technical and photographic affair, where answers were got by pushing buttons or pulling levers. It was his realization of radiology as a plastic art that made him such an outstanding figure in his time. At the back of it all was, of course, an intelligence rare in its breadth and in its warm humanity. He never failed to see the other person's point of view, but his own strong personality prevented him from being deviated from the first principles that came so naturally to him. And with it all there was so much good humour and such zest for life. It was these other qualities—a certain richness, as it were, of nature—that made it easy for him to do things the way he wished without antagonizing others who had competing claims. It was this which made him such a hero to his younger associates: they were able both to respect his intelligence and to admire his personality. A remark that he once made on the differences between

Rugby and Association football indicates his outlook. In Rugby, he said, it was impossible to hate a man brought down in a tackle—you couldn't hate an opponent when you had your arms around him. But in the other game you would dislike with malice a man who, even accidentally, kicked you on the ankle. This is, perhaps, a feeble illustration of his penetrative analysis of cause and effect, but it is an indication of the way he thought. His friends had lessons in courage from the way in which he faced his recurring illnesses. As for his scientific attainments—for they were scientific—they are well enough known. His work on neuroradiology, on the chest, on the stomach, and on tomography is established. Special mention must, however, be made of what he did in the radiology of the brain and spine. In this he was pre-eminent. He brought to this study extreme ingenuity and an understanding of neuroanatomy and physiology which, coupled with his knowledge of physics, enabled him to devise new methods and to explain the defects of current technique. His unusual powers of draughtsmanship, of accurately delineating anatomical relationships, was one of his greatest assets, for it helped the clarity of his thought and exposition. He had recently spent more of his time than was good for him in making models of the cerebral ventricles, a subject that had brought him general praise at the International Congress of Neurology in 1935. Latterly, new ideas seemed to be coming to him faster than ever, as in a final flare that burned him up. He was spurred, as only the very best are, by something inside which would not let him rest. He had that invaluable quality of excitement when inspirations came to him, and he would work almost feverishly on them. That was the artist in him. But he had none of the artist's arrogance, and was most magnanimous in his judgments of other people. At any time he was the most stimulating of companions. People thought better in his company—perhaps that is the highest quality that one can have, and he was able to exercise it, though he always believed that he was the receiver and not the giver. That was not so. Whatever the subject might be, a talk with Twining would waken new ideas, so that everyone sought him either to test a theory, to find its weakness, or to fortify it by further development. Now all that has gone; those who knew him well have lost a brother and are left with a feeling of desolation.

[The photograph reproduced is by F. W. Schmidt, Manchester.]

Dr. MEREDITH R. WHITLA, described in a local newspaper as "Monaghan's grand old man," died at his home there on April 19, aged 80. He was a younger brother of the late Sir William Whitla, M.D., LL.D., of Belfast, the well-known author and President of the British Medical Association at its Annual Meeting in Belfast in 1909. Dr. Meredith Whitla studied medicine at Queen's College, Belfast, and the Royal College of Surgeons in Ireland and qualified L.R.C.P. and L.R.C.S.I. in 1898. At the time of his death he was chairman of the Monaghan Division of the British Medical Association. The following appreciation comes from a medical friend: Meredith Whitla devoted the most of his long life to general practice in the county town of Monaghan, where he was born, and took a strong man's part in promoting in many ways the best interests of that town and county, and of the medical profession there and in Ireland generally. He loved his town and country and the people of both, and everything that interested them was of living interest to him. He had a unique experience of all kinds of practice among well-to-do and poor of all creeds and classes, both in town and country, and often in remote districts, where he had frequently to deal with serious emergencies without delay, an experience most often found among those who have to depend on their own resources. His conversation and advice were greatly appreciated by his medical brethren, being illustrated by reminiscences from many periods of his life, of practice among people of every class, rich and poor, young and old, where he had seen real life with its cares and troubles, sickness and disease, in many forms; at times happiness as well as tragedy and pain, and, best of all, the goodness and sympathy of neighbours when required, and plenty of kindly humour. It has been said that the clergy know men at their best, lawyers at their worst, and doctors as they are. Dr. Whitla was for many years associated with another outstanding man, the late Dr. Campbell Hall of Monaghan, who was surgeon to the County Infirmary and did excellent surgery there till an advanced age. The two men were great friends, and the operating theatre was a meeting place for both consultants and general practitioners. As an outsider who had sometimes the privilege of being there I was much struck with the excellent surgical results. A fine large new county hospital has now taken the place of the one described.

We regret to record the death on May 1 of Dr. JOHN EDWARD HENRY DAVIES, D.S.O., J.P., at the age of 70; he had been a member of the British Medical Association for thirty-four years. Born in Wrexham, the son of the late Dr. Edward Davies, he had received his medical education at the London Hospital, obtaining the conjoint diploma M.R.C.S., L.R.C.P. in 1894 and the L.S.A. in the same year. He practised in Wrexham, where he was surgeon to the Infirmary and medical officer of health to the Northern District of the rural district council. He served throughout the war as lieutenant-colonel in command of the 130th Field Ambulance, 38th Welsh Division, and was awarded the D.S.O. in 1917. Dr. Davies was chairman of the Denbigh and Flint Division of the British Medical Association in 1914 and 1935–7, having been a representative on the Representative Body from 1908 to 1914. His other medical posts included those of consulting surgeon to the Wrexham and East Denbighshire War Memorial Hospital, surgeon to the Great Western and Great Central Railways, and surgeon-in-chief of the St. John Ambulance Brigade in Wales. He was created a Knight of Grace in the Order of the Hospital of St. John of Jerusalem, England.

By the death of Dr. LAWRENCE WEIR BAIN on May 4 at the early age of 48 the medical profession loses one of its outstanding members and his numerous friends mourn the loss of one whose kindness and sympathy, tact and loyalty were an inspiration. He was born in Stornoway and graduated M.B., Ch.B. with honours at Aberdeen University, where he was one of the most brilliant men of his year. He had several house appointments and served in the war with distinction, gaining the Military Cross and being several times mentioned in dispatches. After demobilization he settled in Catford, where he practised until his death. A colleague writes: Bain's interest in all branches of medicine was intense, his clinical observations and deductions careful, balanced, and accurate. He was a man of strong personality, and his knowledge of human nature was profound; his ready sympathy in illness and trouble made him an unwearying friend. Recently he was called to the Bar, and was appointed assistant deputy coroner for South-East London. His interests were wide and varied; a good sportsman and a great lover of the sea, he was never happier than when spending his leisure hours on his yacht or with a gun or rod. Of late years Bain had more than his share of ill-health, which he bore with an unflinching courage and cheerfulness typical of the man. A keen member of the British Medical Association (chairman of the Lewisham Division in 1933–4) and a past-president of the West Kent Medico-Chirurgical Society, Bain's relations with his fellow practitioners were always of a most cordial character. He will long be remembered by his friends; and to his widow, two sons, and relations we offer our heartfelt sympathy in their sorrow.

We regret to record the death of Dr. HENRY LESLIE BATES of St. Albans in his ninety-first year. Born in Streatham, he received his medical education at Guy's Hospital, qualifying M.R.C.S. in 1880 and obtaining the diploma of L.R.C.P. in the next year. He soon joined a medical partnership in St. Albans, and was on the medical staff of St. Albans Hospital from 1884 to 1919; he was consultant surgeon to that institution from 1919 to 1936, police surgeon to the St. Albans City Force from 1885 to 1931, and medical officer of the "Loyal Alban" Lodge of Oddfellows from its inception in 1889 to 1912, when the National Insurance Act came into force, stopping the medical examination of members of the Lodge. In 1931 he was presented with a silver inkstand in recognition of his long connexion with the St. Albans Police Force. Dr. Bates had been a member of the British Medical Association for thirty-eight years. He came of a musical family, and his great-grandfather had conducted the first oratorio performed at the Crystal Palace. Soon after beginning to practise in St. Albans Dr. Bates became a member of the Abbey choir, and retained his membership until a few years ago, being joined in the choir by his son, Dr. Kenneth Bates. In 1886 he had married a daughter of Rear-Admiral Winnington Ingram; she predeceased him in 1932, their only son, Dr. Kenneth Bates, dying in the next year. Dr. Leslie Bates had passed the Chair of the Halsey Lodge of Freemasons in 1895 and of the Royal Arch Chapter in 1900; he subsequently attained Provincial Grand Rank. He was one of the founder members of the Verulam Golf Club, and continued to play long after his eightieth birthday; he captained the club in 1907. He was a keen yachtsman, and was well known at Burnham-on-Crouch. He is survived by two granddaughters.

Dr. THOMAS GREGORY of Holly Mount, Bury Old Road, Manchester, whose death is announced, was one of the best-known practitioners in the northern part of that city. He obtained his medical education at Owens College and obtained the diplomas M.R.C.S., L.R.C.P. in 1896. He later held resident appointments at the Monsall Fever, the Crumpsall, and the St. Mary's Hospitals, and then became surgical registrar at the Manchester Royal Infirmary and at the Christie Hospital for Cancer. He built up a large private practice in the city. During the war he was medical officer to the Heaton Park Hall camp, and he was also honorary medical officer to the East Lancashire Masonic Benevolent Institution. Dr. Gregory was a member of the Manchester Pathological, Clinical, and Medical Societies. He joined the B.M.A. in 1912. A memorial service for him was held in Manchester Cathedral on May 4. He leaves his widow, three sons, and one daughter, who is studying medicine in Manchester University.

Dr. FRANCIS HARRY KELLY, medical officer to Hurstpierpoint College, Sussex, died on May 7, aged 51. Son of the late Major H. C. Kelly, R.M.L.I., he was born at Plymouth and educated at Kelly College, Tavistock, and the Middlesex Hospital, where he served as house-physician after taking the M.R.C.S., L.R.C.P., and the M.B., B.S.Lond. in 1913. He was then senior house-physician at the National Hospital, Queen Square, and during the war held the posts of resident medical officer at King George Red Cross Hospital and surgeon to the Nigress Abbey Memorial Hospital. Dr. Kelly was a member of the Medical Officers of Schools Association and the Brighton and Sussex Medico-Chirurgical Society, and had belonged to the Brighton Division of the British Medical Association since 1930. He was an international rifle shot and a member of the English Eight Club, and deeply interested in the experimental side of shooting. In 1926 he had the distinction of tying for the King's Prize at Bisley, and reached the final stage of that competition on ten occasions. He won the bronze medal in the first stage in 1922, and in 1924 was again in a leading position in the aggregates, but could not remain at Bisley for the latter part of the meeting.

Universities and Colleges

UNIVERSITY OF CAMBRIDGE

At the Congregation held on May 12 Professor E. D. Adrian, M.D., F.R.S., was appointed to represent the University at the bicentenary ceremonies of the Royal Swedish Academy of Sciences in Stockholm from September 23 to 25.

The degree of Master of Arts was conferred on Omond McKillop Solandt of Trinity Hall, M.D.Toronto, University Lecturer in Mammalian Physiology.

The following medical degrees were conferred:

M.D.—D. P. King.
M.B., B.CHIR.—R. H. Winfield.

The second of two public lectures on the psychopathology of fear emotions and reactions will be given on Monday next, May 22, at 5 p.m., in the Lecture Theatre of the Physiological Laboratory, by Dr. E. L. Mira, late director of the Institute of Physiology in the Faculty of Medicine of the University of Barcelona. He will discuss actual methods of treatment of the pathological forms of fear reactions with special reference to results obtained in this field by the psychiatrical services of the Spanish Republican Army in the recent war in Spain. The lecture is open to all members of the University and of Girton and Newnham Colleges.

UNIVERSITY OF LONDON

The report of the Principal on the work of the University during the year 1938–9 has now been published over the signature of Mr. Herbert L. Eason, M.D., M.S., F.R.C.S. In the introductory paragraph he records that "for the greater part of the year the work of the University has been carried on, as has been the work of the nation at large, under the shadow of the European crisis. The aim of the University has been to carry on its work as if such a crisis did not exist, and at the same time to make in advance such arrangements as may be necessary for the continuance of university teaching in time of war, should such arise." During the year the first series of grants from the Central Research Fund was made, together with amounts distributed from the Dixon and Hughes Funds; and of the fifty-eight research workers who received awards nine were candidates carrying out research in the Faculty of Medicine. Dr. J. D. Boyd's appointment to the chair of anatomy at the London Hospital Medical College is recorded, also Professor T. R. Elliott's resignation from the chair of medicine at University College Hospital Medical School and his succession by Dr. H. P. Himsworth. At St. Mary's Hospital Medical School Professor F. S. Langmead will retire from the chair of medicine at the end of the present session. New chairs have been instituted, but not yet filled, in dental surgery and pathology at the Royal Dental Hospital of London, and in the pathology of mental disease at the Maudsley Hospital. The first chair is a new institution to strengthen the teaching staff; the second has been instituted on the resignation of Professor F. L. Golla. The Senate has decided to take no steps at present to fill the chair of radiology at the Royal Cancer Hospital, from which Professor J. M. Woodburn Morison resigned at the end of last session. Dr. R. S. Aitken, on his appointment as regius professor of medicine in the University of Aberdeen, has resigned from the readership in medicine at the British Postgraduate Medical School; and Dr. John McMichael has been appointed to succeed him. In his obituary section Mr. Eason writes: "A great figure in the University has also passed away in the person of Sir Cooper Perry. Sir Cooper's association with the administration of the University began nearly forty years ago when he became a member of the Senate, and, with a break of ten years from 1905 to 1915, it continued till his death. He was Vice-Chancellor for two years and Principal Officer for six. He was a member of the Commission which drew up the present Statutes of the University and was a Crown member of the Court from its inception. In every way he rendered services of the rarest quality, derived from his wide knowledge of men and affairs, his natural wisdom, and his scholarship. His name will always be held in high honour throughout the University."

At the meeting of Convocation held on May 9 elections took place for representatives of Convocation on the Senate, when all the sitting members were re-elected. These include Sir Ernest Graham-Little, M.D., F.R.C.P., M.P. (Medicine), and Professor M. Greenwood, D.Sc., F.R.C.P., F.R.S. (Science).

UNIVERSITY OF MANCHESTER

Dr. Walter Schlapp has been appointed Assistant Director of the Physiological Laboratories; and Dr. A. A. Harper Lecturer in Human Physiology.

Degrees in the Faculty of Medicine will be conferred on Saturday, July 8.

The Council of the University have approved the following changes in the staffing of the Department of Surgery. Professor John Morley will continue as professor and director of the Department; Mr. Harry Platt has been appointed Professor of Orthopaedic Surgery; and Mr. Geoffrey Jefferson Professor of Neurological Surgery. Both these appointments will take effect at the end of September.

UNIVERSITY OF SHEFFIELD

At its meeting on May 12 the University Council received with regret the resignation of Mr. J. Hughes of the post of Honorary Demonstrator in Anatomy, and accorded him its thanks for his services to the University.

UNIVERSITY OF EDINBURGH

The third Sharpey Schafer Memorial Lecture, on "The Metabolism of the Heart," will be delivered by Professor C. A. Lovatt Evans, F.R.S., director of the Department of Physiology, Biochemistry, and Pharmacology at University College, in the anatomy classroom, University New Buildings, Teviot Place, Edinburgh, on Friday, June 9, at 5 p.m. All interested are invited to attend.

ROYAL COLLEGE OF SURGEONS OF ENGLAND

An ordinary meeting of the Council was held on May 11, with the President, Mr. Hugh Lett, in the chair.

Sir Arthur MacNalty and Mr. H. Muir Evans were admitted to the Fellowship. Mr. Seymour Barling was elected a member of the Court of Examiners. Professors E. B. Stibbe and Samson Wright were appointed to examine for the Primary Examination for the Fellowship to be held in India and Egypt in 1939–40.

It was reported that a Mackenzie Mackinnon Research Fellowship had been awarded to G. W. Hayward, M.D., M.R.C.P., of St. Bartholomew's Hospital, for research on "The Relationship between Pulmonary Congestion and Dyspnoea," and that the Gilbert Blane Medal for 1939 had been awarded to Surgeon Lieutenant-Commander J. Mansel Reese, M.R.C.S., D.P.H., R.N.

Diplomas

A diploma of Fellowship was granted to Henry Meredith Martin of Trinity College, Dublin.

Diplomas of Membership were granted to John Charles Alexander Innes of London Hospital and Fakirbhai Hirabhai Patel of Edinburgh, and to the 220 candidates whose names were published in the report of the meeting of the Royal College of Physicians of London in the *Journal* of May 6 (p. 957).

Diplomas in Tropical Medicine and Hygiene were granted to the twenty-seven candidates whose names were published in the report of the meeting of the Royal College of Physicians of London in the *Journal* of May 6 (p. 958).

Medical Notes in Parliament

In the House of Lords this week the Camps Bill was considered and minor Bills were advanced.

The House of Commons completed the committee stage of the Military Training Bill, in which amendments were made. The pay of militiamen was discussed, and an increase in this was announced. A White Paper was issued which set out Government proposals for the future of Palestine and for the regulation of immigration into that country.

Military Training Bill

During the debate on May 8 on the motion for the second reading of the Military Training Bill Mr. HORE-BELISHA said that the principle to which the Government asked assent was that every man starting his militia service should start level with his fellows, his progress thereafter being determined solely by his own qualities. The War Office had provisionally apportioned to the several arms of the Service their quotas of the total of the militiamen likely to be available. The Ministry of Labour offices throughout the country would call up enough men for examination in each area. Each man, having been medically examined, would be interviewed by a representative of the Army, who would check information as to his education and trade and report the arm for which he was most suited, and consider any preference he might have for any particular unit. It was intended that recruits for the infantry on joining should be graded into a more or less advanced squad according to their special knowledge and intelligence, so that the more capable should not be held back by the less apt. Men above the average would be pushed on more rapidly, and the pick of the batches who had gone ahead of the others would spend their last two months of training in a section and platoon-leading school attached to the Small Arms School at Netheravon. From these would be selected those who, if they desired, would be available as officers for the Territorial Army, for the Reserve Militia, or for further training in officer-producing units. Merit and not adventitious recommendation would be the claim to advancement under the scheme.

The second reading was carried by 387 votes to 145.

The House afterwards considered the financial resolution of the Military Training Bill in committee. Sir VICTOR WARRENDER said it was estimated that out of the total capital expenditure of £30,000,000, £25,000,000 would be the cost of erecting hutted accommodation around barracks and depots and in camps for the militia. Money would also be required for expenses in connexion with the hardship committees, local and other tribunals, and medical boards. There would be 120 medical boards, and probably rather more hardship committees. They would cover roughly the same areas as the courts of referees. After a sitting which lasted until 5.15 a.m. on May 9 the financial resolution was carried by 159 votes to 65.

POSITION OF UNIVERSITY STUDENTS

The Bill was considered in Committee on May 10, when Mr. GARRO-JONES moved to insert that the Bill should not apply until a youth attained the age of 18 years. Mr. HORE-BELISHA said that the Bill provided that the military training normally to be taken between the ages of 20 and 21 years might be postponed or ante-dated. Nothing in it, however, fixed the age down to which this service might be ante-dated. He understood it was to meet this that Mr. Garro-Jones proposed the limit of 18 years. He himself would be ready to accept the limit of 17½ years to suit the convenience of these young men. Mr. ALAN HERBERT cited a letter from the Registrar of Oxford University, which declared that of 1,000 boys who would come up in 1940, 500 would come up under the age of 18½. If these boys were not given the option to postpone training they would begin it under the age of 18. This was regarded with anxiety by many headmasters and by the universities because of the risk that at that age a six-months break might be followed by reluctance to resume academic work as well as by loss of habits of intellectual application. Those objections diminished as the boys grew older. Mr. HORE-BELISHA said that the cases referred to by Mr. Herbert could be met under the Bill as it stood. The Minister might ante-date or post-date the liability to suit the convenience of the applicant, and naturally the Minister wished not to damage the careers of these young men. He would fix the date according to the best interests of the student.

The amendment was rejected.

Mr. GREENWOOD then proposed to insert a provision permitting the Minister to allow any person registered for service to postpone his liability to be called up if he was undergoing a term of apprenticeship or engaged in full-time education or otherwise studying for a professional examination or university degree. He said his amendment would make such action compulsory on the Minister. The Opposition would like a university student to be entitled to postpone his period of service until after the end of his university career. Mr. LENNOX BOYD said he could not accept the amendment, as the Government felt the matter must be left to the discretion

of the Minister and of the hardship committees. University students whose examinations were due in June of this year would be able to go through their examinations without fear of being called up, since it would not be possible to send out notices before June at the earliest. Any comments which members might make on the subject to the Government would be taken into full account.

Mr. Greenwood's motion was defeated.

On May 11, in a discussion of Clause 4 (Medical examination), Mr. SHINWELL pointed out that no provision was made for calling up men for medical examination within a certain period. The clause should specify the number of days to elapse between the calling-up notice and the appearance of the man for medical examination. Mr. ERNEST BROWN preferred that the Bill should not state a definite period; it was in the mind of the Government to provide two or three days' notice for the medical examination.

Mr. Shinwell's amendment was rejected.

Mr. LENNOX-BOYD then moved a provision that where notice had been served the Minister might cancel it or serve a further notice altering the place or time at which the man was required to submit himself to a medical examination.

This amendment was agreed to.

APPELLATE MEDICAL BOARDS

Mr. SILKIN moved to provide for the appointment of an appellate medical board. He said this and a subsequent amendment were put down to ensure that a person who was not satisfied with the decision of a medical board should have an opportunity of appeal. The Bill laid down no standard of medical fitness, and did not declare whether the purpose of the medical examination was to determine whether a person was fit for military training or whether he was fit for military service. The two standards might differ. Moreover, there were to be 120 different medical boards, which might adopt a variety of standards. Each board would examine some 2,500 men under great stress, and would be liable to make serious mistakes. The boards had been told that they were expected to produce two men out of every three, and would tend to work on that basis, which had been put before them by the Bill itself.

Dr. HADEN GUEST, supporting the amendment, said that appellate boards would be necessary not only from the standpoint of the man examined but from that of the board itself. No one, least of all the medical profession, wanted people to join the Army who would promptly become casualties, and he hoped the House would have some description of what the physical standard would be for the men between 20 and 21. By examining them they would secure a view of the condition of those people who were born in the immediate post-war years, which would be interesting from a medical point of view. He did not agree that the medical boards would try to pass two out of every three men appearing before them.

Mr. W. S. MORRISON said the Government felt that rather than have a board and an appeal the House ought to concentrate on getting the strongest possible boards in the first instant which would examine the men with as much care as possible in the first instance. If that was done it would be hard to find any medical authority to which a properly constituted board could be considered as inferior enough to justify appeal. The medical profession would treat it as their duty not to put any man into the service unless they honestly believed that he was fit to undergo his training. Steps would be taken to make sure that there was ample time for examination, and the Bill made it clear that if the board had not time to complete an examination on one day it could go on to another day. The medical men on the board would normally be five general practitioners of established reputation. They would work as a team, and one of the five was almost certain to spot anything wrong with any man coming before them. The Bill enabled the board to take the advice of a specialist if it was confronted with some trouble or difficulty. There was no such thing as a body of medical opinion to which an appeal could be made as a higher authority on this matter of examining men.

Dr. GUEST pointed out that the medical board had the right to call in a consultant, and suggested that this same right should be conceded to the man examined. Mr. MORRISON replied that he would consider this suggestion, but the conception of the Government was that the medical board of general practitioners, together with consultants, would consider themselves charged to look after the interests of the man.

Mr. Silkin's amendment was defeated.

RECORDS OF PHYSICAL HEALTH

Mr. ELLIS SMITH moved to insert a provision that the result of the medical examination should be entered in the records of the person examined, and should be conclusive evidence of that person's physical condition and state of health at the time of examination. Dr. HADEN GUEST said he was told that the standard of military fitness would not necessarily be the War Office standard. The House should know what it was, and the record of the examination should be more exhaustive than the usual record of an army examination, and should cover nasal, eye, and ear conditions. Mr. LENNOX-BOYD said that if a man did not receive a clean bill of health at his examination that would be conclusive evidence that he was not in a good state of health at the time. The record would be available as proof. It was intended that the medical boards should group the men into four categories. Those of the bottom category would not be called up for training, and those of the third category would not undergo such training as would imperil their health.

The proposed amendment was defeated.

The committee stage was resumed on May 12. Mr. A. V. ALEXANDER moved to provide that men should not be called up unless there were available for them accommodation on a basis of floor space and air space equal to the peace-time standard of the Regular forces at home stations. He cited the Special Report No. 50 of the Medical Research Council, issued in 1920, on the excess mortality among young men called up in this country during the war which followed overcrowding in hutments and barracks. Sir VICTOR WARRENDER said he could give Mr. Alexander the assurance he sought. The War Office would make no demands on men for whom it had no accommodation. They would be accommodated on the same scale as the Regular soldier, with a minimum of 60 square feet per man. For a time, until hut accommodation was available, some of the men might be put into tents, eight men per tent. There had been no epidemic of cerebrospinal fever in the Army during recent years, and in the last five years the cases had averaged thirty-three annually for the Army as a whole.

Mr. SHINWELL and Mr. MCGOVERN protested against the use of tents. Mr. MARKHAM said the overcrowding in the last war was not in tents. There were medical grounds for urging that young men in industrial centres should get open-air life under proper camping conditions.

Mr. Alexander's amendment was rejected.

The committee stage continued on May 15. Sir FRANCIS FREMANTLE asked for an assurance about the siting of camps in catchment areas and the need to avoid pollution of water supplies. Sir DONALD SOMERVELL replied that the authorities would be anxious to see that the camp sites were healthy, and the considerations which Sir Francis Fremantle suggested would be borne in mind. There would be consultation where necessary with the public authorities affected.

On May 16 Mr. ERNEST BROWN stated that, on the assumption that the Bill received the Royal Assent before Whitsun, registration of all men liable would take place on Saturday, June 3. Medical examination of men registered would begin on Thursday, June 8, with at least two days' clear notice in each case.

The committee stage continued on that date.

Certification under Mental Deficiency Act

Sir ARNOLD WILSON on May 4 raised a judgment of the King's Bench Divisional Court on April 26 as to the validity of a certificate under the Mental Deficiency Act, 1913, signed by two doctors, one of whom had not seen the person to whose mental condition he testified.

Mr. KENNETH LINDSAY said that under Section 31 of the Mental Deficiency Act, 1913, it was the duty of the local

education authority to make arrangements, subject to the approval of the Board of Education, for ascertaining what children were incapable by reason of mental defect of receiving benefit from instruction in special schools or classes, and for that purpose to obtain in each case a certificate, in a form prescribed by the Board, from a duly qualified and approved medical practitioner. The section further provided that in cases of doubt the matter should be determined by the Board of Education. The approved arrangements required the child to be examined by the medical practitioner who was to give the certificate. Mr. Lindsay went on to say that in the case referred to the court appeared to have criticized the proceedings of the local education authority on the ground, first, that the certificate was signed not only by the approved medical practitioner who had examined the child but also by a second medical practitioner who had not examined the child, and secondly on the ground that the case (being one of doubt) was not referred to the Board of Education for determination.

Mr. Lindsay remarked that there was nothing in the approved arrangements to countenance the signing of the certificate by a second practitioner who had not examined the child. Lord De La Warr was making further inquiries, on the results of which he would consider whether any change in the prescribed forms of certificate was desirable.

Reserve and Auxiliary Forces Bill

In the House of Commons on May 9 Mr. HORE-BELISHA moved the second reading of the Reserve and Auxiliary Forces Bill. He said that it was proposed, in order to ensure our greater preparedness, to call up in batches and at convenient dates a large proportion of our Regular Reserves, including officers, who were within the scope of the Bill. They would be required to serve, so far as could be foreseen, for not more than three months. Personnel of the Territorial Army anti-aircraft units would be called up this summer in rotation, so that no individual would be on service for more than a month. They would be at war stations. Everyone called up under the Bill would receive the protection of Clause 2, which provided for reinstatement in his former occupation.

The Bill was read a second time.

Vaccination of Recruits

On May 9 Sir VICTOR WARRENDER told Mr. Leach that the War Office would follow the precedent of 1916 in regard to the vaccination of recruits, and suspend the vaccination regulations so far as conscripts were concerned.

Typhoid at Nottingham

Mr. BERNAYS told Mr. W. S. Liddall on May 10 that Nottingham Corporation had refused to give any information to the injured parties with reference to the recent typhoid outbreak. As the outbreak did not present any special features of public health interest and the measures taken by the local authority to deal with it were speedily effective, Dr. Elliot did not consider there were any grounds for holding a public local inquiry.

Medicine Stamp Duty

Sir Francis Fremantle presided on May 10 at a meeting of the Health and Housing Committee of Government supporters in Parliament. This meeting considered Sir John Simon's proposal to abolish the Medicine Stamp Duties, and was attended by Mr. Hugh Linstead, secretary of the Pharmaceutical Society. The committee is understood to have been in general agreement that the repeal of the duties would hinder the progressive endeavour of reputable manufacturers and newspapers for the suppression of undesirable methods in the industry and for the censorship of advertisements in the interests of the public. It was decided to appoint a subcommittee for immediate consultation with the British Medical Association, the Pharmaceutical Society, and others concerned regarding points which should be submitted by a deputation to the Chancellor of the Exchequer or in amendments to be moved when the Finance Bill was in committee. Speakers at this meeting included Sir Arnold Wilson and Mr. Keeling, who had been members of the Select Committee on the Medicine Stamp Duties. It was subsequently stated that the committee regretted the proposed repeal of the duties, and considered that it would be difficult or impossible to give the consumer the benefit of the remission of nearly £750,000 yearly. It was said to be likely that this sum would be used for advertisements to encourage the increasing habit of self-medication by the public. Another objection taken was the injustice to fully qualified pharmacists. Speakers said the inducement to disclose the formula of a remedy in return for exemption from the duty would disappear, and there would be a return to former conditions, when unscrupulous manufacturers would vary their secret remedy according to the market price of drugs.

Camps Bill

Lord DE LA WARR in the House of Lords on May 11 moved the second reading of the Camps Bill, which had already passed the House of Commons.

The BISHOP OF MANCHESTER hoped that due precautions would be taken about health. Illness could run rapidly through a children's camp, and it was not every medical officer of health who was capable of dealing with the problem of 300 or more children suddenly brought into the district.

Lord DAWSON OF PENN, in the course of his speech, said the Bill was a social experiment which would teach much which at present the nation did not know. It was right to begin with the problem of youth, and to make the task of building for fitness the first act of constructive statesmanship. Even a fortnight in camp school would be an excellent thing for children. But what about open-air schools? He had never seen any harm come to children at these schools; the camps could be used with great advantage to the inmates all the year round, whatever the weather, if they were properly built. When children of a suitable age were educated and put on proper diet in a camp for three or four months the difference in those children at the end of the period was startling, as also was the change in those youths who were sent to special camps at Aldershot when they were not strong enough or big enough to be taken as recruits.

Lord DE LA WARR said that when the Bill was introduced the Government estimated that the camps would be used for five months in the year. He now thought they would be able to use them for a longer period. The camps would be built for winter use, and would be heated, because for purposes of evacuation they might have to be used in midwinter.

The Bill was read a second time.

The House of Lords passed the Camps Bill through committee on May 16.

Royal Commission on Workmen's Compensation

Mr. TOM SMITH asked on May 11 if the Royal Commission on Workmen's Compensation proposed to issue an interim report. Sir SAMUEL HOARE replied that the Commission felt their primary duty to be the examination of the working of the existing system and the consideration of whether that system should be maintained with modifications or whether some different system should be instituted. Until the Commission reached a conclusion on this fundamental question of principle they could not well attempt to formulate definitive recommendations on any particular part of the subject. This preliminary work would take time, and it would not be wise during these inquiries to attempt to formulate legislation dealing with any of the larger issues.

Tuberculosis in Wales: 800 Additional Beds in Peace-time

Captain ARTHUR EVANS on April 11 asked what action Dr. Elliot proposed to give effect to the recommendations of the recent Committee of Inquiry into the Anti-tuberculosis Services in Wales and Monmouthshire. Dr. ELLIOT, in reply, said the report drew attention to the high incidence of tuberculosis in Wales, and pointed out that the ratio of beds to cases was lower in Wales than in England. It was clearly

desirable that all practicable steps should be taken to reduce infection arising from contact with active cases. The first step in this direction must be to reduce the long list of waiting cases which existed, particularly in South Wales. He was accordingly arranging for the immediate construction in South Wales, under the emergency hospital arrangements, of a new hutted hospital of some 600 beds, which will be made available in peace-time to the Welsh National Memorial Association on favourable terms. The provision on similar terms of some 200 beds in hutments attached to an institution in North Wales was also proposed. Arrangements for Central Wales, possibly in the Shrewsbury area, were under consideration. He hoped that this new accommodation would be available for the treatment of tuberculosis within the present year without prejudice to the plans now under consideration by the Welsh National Memorial Association. In addition he had detailed three housing inspectors to undertake a careful survey of the rural counties of Wales and to discuss with the local authorities concerned the best methods of solving their housing problems. He was also in conference with certain authorities on other aspects of the committee's recommendations.

Mr. JENKINS asked Dr. Elliot on May 11 to fix the date on which the conference of local authorities of Wales and Monmouthshire would be held to deal with the report of the Committee on the Anti-tuberculosis Services in Wales. Dr. ELLIOT said he was anxious this conference should take place soon, but it would not be expedient for it to be held before the individual local authorities had full opportunity of considering the issues raised in the report. Meanwhile he was proceeding with interviews and correspondence with individual authorities.

B.M.A. Nutrition Conference

Mr. BELLENGER asked Dr. Elliot on May 11 whether, in collaboration with the Minister of Agriculture, he was giving consideration to the terms of the resolution unanimously carried at the conference on the wider aspects of nutrition recently convened by the British Medical Association, which urged upon the Government the formulation of a long-term food policy, in which the requirements of health, agriculture, and industry should be considered in mutual relation. Dr. ELLIOT answered that the resolution had not yet been submitted to him. He was aware of its terms, and would give careful consideration, in consultation with such other Ministers as were concerned, to any representations made by the British Medical Association in support of it.

Certified Insane

Dr. ELLIOT stated on May 11 that the number of persons certified insane in England and Wales in 1938 was 17,276. This was lower than the number certified in 1937, 1936, or 1935. The numbers of institutions under the Lunacy and Mental Treatment Acts, 1890 to 1930, and under the Mental Deficiency Acts, 1913 to 1938, were 182 and 288 respectively. Persons notified as under care under these Acts on January 1, 1939, numbered 157,584 and 89,904 respectively; of these, 153,749 and 46,054 were in institutions. The Board of Control was directly responsible for the State Institution for Mental Defectives, which contained 1,475 patients.

Medical Certificates for Extra Nourishment for Unemployed.—Mr. GALLACHER asserted on May 11 that a number of local unemployment assistance boards refused to accept certificates from applicants' own doctors in support of requests for extra nourishment. Mr. ERNEST BROWN answered that medical certificates indicating the need for extra nourishment arising from some specific pathological condition were normally accepted without question. In some instances certificates were given in quite general terms to persons who were not otherwise receiving medical attention. In these cases the practice was to make further inquiry before deciding whether the allowance should be increased. In certain other cases where doubt arose the question was referred to the regional medical officer of the Ministry of Health. The Board had no reason to believe that doctors regarded these steps as reflecting on their integrity or competence.

Condition of Crews' Quarters in British Ships.—On May 2 Mr. STANLEY told Mr. D. Adams that the annual report of the port medical officer of health for Liverpool stated that the number of dirty crew quarters was distressingly high in British ships, and that 100 more were found verminous than in the preceding year. Paragraph 30 of the Crew Space Instructions of 1937 provided that a master of a ship should satisfy himself by frequent and regular inspections—the results of which should be entered at least once a week in the official log—that the crew's quarters were maintained in a proper condition, that the quarters were cleaned daily, and that every effort was made to detect the presence of vermin and to deal with it immediately. The question of cleanliness was primarily for the owners, officers, and crew. The Shipping Federation and the National Union of Seamen had a joint committee which was considering methods of improving the standard of cleanliness and comfort in crews' quarters.

Schools for Deaf Children in Scotland.—Mr. COLVILLE told Mr. R. Gibson on May 9 that there were at present in Scotland six residential schools for deaf children, situated in Aberdeen, Dundee, Edinburgh, Glasgow (two), and Lanarkshire, four day schools in Dundee, Glasgow, and Renfrewshire (two), and three special classes attached to ordinary schools in Glasgow, Dumbartonshire, and Lanarkshire. He was not aware that education authorities were failing to fulfil the duty laid on them by Section 3 of the Education (Scotland) Act, 1890, as amended by Section 6 of the Education (Scotland) Act, 1936, which required provision to be made for the efficient education of deaf children from the age of 3 years.

Rheumatism Clinic at Colliery.—On May 9 Mr. D. ADAMS asked the Secretary for Mines whether he was aware of the establishment of a clinic for the treatment of rheumatism among mineworkers at Horden collieries, and in view of the prevalence of this affliction among miners he would give special attention to this experiment with a view to its general extension in the coalfields. Mr. LLOYD said he was aware that discussions were in progress for building and equipping a clinic at the Horden colliery baths by means of grants from the Miners' Welfare Fund. This experiment would be the first of its kind, and he would watch the results closely.

Cod-liver Oil Reserves.—Mr. W. S. MORRISON told Mr. Richard Law on May 10 that it had been decided that a Government purchase of cod-liver oil for emergency was not called for. Insurance against shortage in emergency had been provided by a commercial firm which undertook to maintain in this country a reserve of cod-liver oil of medicinal quality.

New Silicosis Regulations.—Mr. JAMES GRIFFITHS asked on May 11 when Sir Samuel Hoare proposed to issue the new regulations, under the various industries silicosis schemes, extending the period within which certification could take place to five years. Mr. PEAKE replied that the Home Office was in communication with the General Council of the Trades Union Congress on the draft scheme. Sir Samuel Hoare hoped to make a decision very shortly. It was proposed that the scheme should come into force on the date on which it was made. Sir Samuel could not make it apply retrospectively.

Housing and Slum Clearance.—The numbers of dwellings completed in England and Wales at March 31 last to replace slum dwellings and for the abatement of overcrowding were 273,255 and 23,915 respectively. At that date about 51,000 dwellings were under construction under the Housing Acts, most of which will be allocated to the above purposes. The number of further houses required is probably about 250,000 to 300,000.

Sir John Anderson has arranged, in consultation with the Ministry of Health, that all medical and nursing personnel in hospital or first-aid posts in vulnerable areas shall be supplied with the civilian duty type of respirator. Recent experiments are said to confirm that this type is best for the purpose.

Medical News

The House of the British Medical Association, including the Library, will be closed for the Whitsun holiday from 5 p.m. on Friday, May 26, to 9 a.m. on Tuesday, May 30. (Library 10 a.m.)

The House and Library of the Royal Society of Medicine will be closed for the Whitsun holiday from Saturday, May 27, to Monday, May 29, both days inclusive.

Dr. Henry Yellowlees will deliver the Morison Lectures for 1939 on "The Problem of Adolescence" in the Hall of the Royal College of Physicians of Edinburgh on Thursday and Friday, June 8 and 9, at 5 p.m.

Professor J. B. S. Haldane, F.R.S., will deliver the Cavendish Lecture on "Congenital Disease" before the West London Medico-Chirurgical Society at Kensington Town Hall, W., on Thursday, June 8, at 8.30 p.m. There will be a reception from 8 p.m. and the annual conversazione will follow the lecture.

A meeting of the Medico-Legal Society will be held at 26, Portland Place, W., on Thursday, May 25, at 8.30 p.m., when an address will be given by Dr. L. A. Weatherly on "Insanity Defence in Murder Trials—A Debatable Practice of Procedure."

The twenty-sixth annual meeting of the Swiss Roentgen Society will be held at Zurich on June 3 and 4. Further information can be obtained from Dr. Max Hopf, Effingerstrasse 49, Berne.

Mr. Hugh Lett, C.B.E., President of the Royal College of Surgeons of England, will present prizes and certificates to successful students of the London (Royal Free Hospital) School of Medicine, University of London, on Thursday, June 1, at 3 p.m.

On May 25 and 26 the French Société de Chimie Biologique will celebrate in Paris the twenty-fifth anniversary of its foundation. Professor G. Bertrand will preside. The fiftieth anniversary of the foundation of the Société Française de Dermatologie will be celebrated on June 22.

Before the reception of patients on June 11 the new Westminster Hospital will be open for private inspection by Governors and subscribers, who may be accompanied by friends, on June 1 and 2 at 2.30 p.m. These visitors will be invited to take tea. In order that adequate arrangements may be made the secretary of the hospital will be glad to receive early intimation from those desiring to take advantage of this opportunity to see the new hospital, addressed to him at Westminster Hospital, Broad Sanctuary, S.W.1.

One hundred years of relief work for fishermen and mariners of all nations shipwrecked on the shores of the British Isles was celebrated in London on May 11, when the honorary agents of the Shipwrecked Fishermen and Mariners Royal Benevolent Society were entertained by their president, Admiral of the Fleet Sir Roger Keyes, the chairman, Admiral Sir Michael Hodges, and the committee. The Duke of Kent congratulated the society upon its splendid record. Nearly 900,000 seafaring men and their dependants have benefited during the hundred years. The foundation of the society is recalled by a painting hanging in the offices at Carlton House, Lower Regent Street. This represents a Bristol pilot, C. G. Jones, reading to John Rye, a philanthropic medical man of Bath, an account of a terrible storm in 1839 by which several fishing boats of Clovelly were lost with all hands. Mr. Rye having proposed the forming of a fund, a meeting was held at the London Tavern, Bishopsgate Street, with Admiral Sir George Cockburn in the chair. In the early 'seventies the society placed nine lifeboats on the coast, but eventually these were handed over to the Royal National Life-Boat Institution so that all could be under one management.

The *Dermatologische Zeitschrift*, founded in 1897, has ceased publication.

The late Mr. T. W. Pattinson, retired surgeon of Bournemouth, bequeathed £500 to the British Medical Association for its Charities Fund.

The Imperial German Academy at Halle has awarded the Cothenius medal to Dr. Alfred Vogt, professor of ophthalmology at Zurich, for his pioneer work in certain branches of his specialty.

At the 600th anniversary of the foundation of the University of Grenoble Sir StClair Thomson, M.D., and Mr. A. Tudor Edwards, F.R.C.S., attended as delegates from the University of London.

In our advertisement columns this week the University of Sheffield invites applications for a Professor of Bacteriology. The salary attached to the post is £1,000 per annum.

EPIDEMIOLOGICAL NOTES

Infectious Diseases for the Week

The decline in the incidence of pneumonia (primary and influenzal) and the rise in the prevalence of scarlet fever, referred to in these columns last week, continues. Appreciable increases in the notifications of scarlet fever were recorded for England and Wales, London, and Scotland, while in Eire and Northern Ireland slight decreases were encountered. The increase in England and Wales is accounted for almost entirely by an epidemic in the borough of Crosby, near Liverpool; in the week under review 58 cases were notified, compared with an average of 10 in the previous four weeks, the actual numbers for each week being 7, 14, 7, and 13 (immediately preceding week) respectively. The outbreak, consisting of some 150 cases, was explosive in character and is considered to be due to the ingestion of some article of food; in addition, some 50 "secondary" cases, not connected with the supply of food, have occurred from infection by the original cases. There has been one death, of a woman. The incidence of the disease fell on adults more than on children, due probably to the fact that a considerable proportion of the children of school age had previously been immunized against scarlet fever. The epidemic of diphtheria in South Shields, to which attention has been drawn on several occasions, appears now to have abated; only 3 new cases were notified in the week under review, the lowest number since the week ended April 30, 1938. The termination of the epidemic is due in large part to the immunization campaign for school children, which was later extended to children under school age. Since the beginning of last year there have been 847 cases and 84 deaths.

Small-pox in Africa, 1938

During the year small-pox was present in epidemic form in Southern Rhodesia, Southern Province of Tanganyika Territory, French Sudan, Nigeria, Anglo-Egyptian Sudan, Belgian Congo, and Angola; in the four last-named territories the virulent form of small-pox was encountered. In the Southern Provinces of Nigeria the number of cases rose from 564 in 1937 to 3,070 in 1938, and in the Northern Provinces from 3,095 to 4,274. In the Belgian Congo 3,292 cases were reported during the year, of which 1,216 cases were in the province of Lusambo; during 1937 approximately one and a half million persons were vaccinated amongst a total population of ten millions. The epidemic in the Anglo-Egyptian Sudan was ascribed to cases imported from Abyssinia and Eritrea and spread from the Blue Nile Province westward to Kordofan Province and towards the end of the year to Darfur. During 1937 561,000 persons were vaccinated in the Anglo-Egyptian Sudan. The Southern Rhodesian epidemic began in October, 1937, and reached its peak during the second half of July, 1938. During 1937 nearly 344,000 vaccinations were carried out among the population of about 1,300,000. Of the 520 cases reported in the Union of South Africa in 1938, 453 occurred in the Transvaal. In Tanganyika the number of cases fell from 1,462 with 28 deaths in 1937 to 1,095 with 27 deaths in 1938.

No. 18

INFECTIOUS DISEASES AND VITAL STATISTICS

We print below a summary of Infectious Diseases and Vital Statistics in the British Isles during the week ended May 6, 1939.

Figures of Principal Notifiable Diseases for the week and those for the corresponding week last year, for : (a) England and Wales (London included). (b) London (administrative county). (c) Scotland. (d) Eire. (e) Northern Ireland. Median values for the last 9 years for (a) and (b).

Figures of Births and Deaths, and of Deaths recorded under each infectious disease, are for : (a) The 126 great towns in England and Wales (including London). (b) London (administrative county). (c) The 16 principal towns in Scotland. (d) The 13 principal towns in Eire. (e) The 10 principal towns in Northern Ireland.

A dash — denotes no cases ; a blank space denotes disease not notifiable or no return available.

Disease	1939					1938 (Corresponding Week)					1930-8 (Median Value Corresponding Weeks)	
	(a)	(b)	(c)	(d)	(e)	(a)	(b)	(c)	(d)	(e)	(a)	(b)
Cerebrospinal fever	32	3	13	1	—	21	3	4	1	—		
Deaths		—	—				—	—				
Diphtheria	784	78	148	32	12	995	103	194	50	25	946	160
Deaths	25	1	4	1	—	27	3	6	1	—		
Dysentery	32	2	21		—	49	13	77		—		
Deaths				—	—			—	—	—		
Encephalitis lethargica, acute	2	—	—		—	9	—	2		—		
Deaths		2					—	1				
Enteric (typhoid and paratyphoid) fever	24	1	7	7	2	8	—	41	2	—	32	
Deaths	1	—	—	—	—	1	—	—	—	—		
Erysipelas			57	3	5			63	3	9		
Deaths		—					—	1				
Infective enteritis or diarrhoea under 2 years												
Deaths	37	3	9	8	1	50	13	10	7	4		
Measles		28	140		1			461		12		
Deaths	3	—	—	4	—	32	13	17	2	3		
Ophthalmia neonatorum	80	8	29		1	98	9	37		—		
Deaths												
Pneumonia, influenzal*	773	71	13	2	8	1,222	85	9	5	23	1,021	77
Deaths (from influenza)	50	6	4	—	1	54	8	3	1	1		
Pneumonia, primary			192	10				273	14			
Deaths		11		13	6		34		18	12		
Polio-encephalitis, acute	2	—				1	—					
Deaths		—					—					
Poliomyelitis, acute	3	—	—		—	4	—	—		—		
Deaths		—					—	—				
Puerperal fever	3†	3	10	2	—	5†	5	23	3	1		
Deaths		—					2‡					
Puerperal pyrexia	173	17	14		—	182	10	17		8		
Deaths												
Relapsing fever	—	—			—	—	—	—		—		
Deaths								—				
Scarlet fever	1,665	176	285	51	73	2,078	174	428	92	91	1,889	229
Deaths	1	—	—	—	—	3	—	1	1	—		
Small-pox	—	—	—		—	1	—	—		—		
Deaths	—	—		—	—	—	—	—	—	—		
Typhus fever	—	—	—	—	—	—	—	—	—	—		
Deaths				—	—			—	—	—		
Whooping-cough		403	298		28			68		24		
Deaths	13	1	6	3	2	16	2	—	—	—		
Deaths (0-1 year)	319	43	71	30	20	330	47	64	27	20		
Infant mortality rate (per 1,000 live births)	50	37				55	39					
Deaths (excluding stillbirths)	4,735	881	663	161	145	4,943	936	652	207	168		
Annual death rate (per 1,000 persons living)	11.6	11.3	13.4	10.8	12.7	12.2	11.8	13.3	14.0	14.9		
Live births	6,565	1,200	974	356	259	7,276	1,403	1,022	461	290		
Annual rate per 1,000 persons living	16.1	15.4	19.7	23.9	22.7	17.9	17.7	20.9	31.1	25.7		
Stillbirths	269	53	45			340	66					
Rate per 1,000 total births (including stillborn)	40	37	44			45	45					

* Includes primary form in figures for England and Wales, London (administrative county), and Northern Ireland.

† After October 1, 1937, puerperal fever was made notifiable only in the administrative county of London.

‡ Deaths from puerperal sepsis.

Letters, Notes, and Answers

All communications in regard to editorial business should be addressed to THE EDITOR, BRITISH MEDICAL JOURNAL, B.M.A. HOUSE, TAVISTOCK SQUARE, W.C.1.

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QUERIES AND ANSWERS

Income Tax

Deduction for Rent

"J. F. M." rented his house up to November, 1938, for £50 per annum, of which one-half was allowed as a practice expense; as from that date he is the owner of the house, which has a rateable value of £28.

*** In the case of premises owned the amount of the net income from assessment on which tax is payable takes the place of the "rent." For the period from November, 1938, onwards, therefore, "J. F. M." will be entitled to claim as an expense one-half of £28 (or whatever is the amount of the net income tax assessment) in lieu of one-half of £50.

Liability of a Medical Society

"INTERESTED" inquires as to the position of a society which is without invested capital or endowment and depends entirely on the subscriptions of members and associates. There are no paid officials.

*** Seeing that the society is not carrying on any trade or business and has no income from investments there is no liability to assessment. The request of the inspector of taxes for a copy of the society's accounts is presumably made to obtain corroboration, in the usual form, of the statement that the society has no assessable income. The request is not legally enforceable but seems not unreasonable, and it is probably best to comply with it.

LETTERS, NOTES, ETC.

Payment for a Colleague's Services

Dr. H. S. DRABBLE writes on a subject of perennial difficulty: I should like to bring to notice what I consider to be a real necessity to the medical profession—namely, some scheme to remunerate those doctors who attend to their colleagues and their families without payment. I myself have had a long illness, and on several occasions my wife and I have received treatment from various medical men. The usual expression of gratitude in the form of useless gifts seems inadequate, and in several cases (which includes my own) a long illness reduces one's income. If some scheme could be arranged whereby every practitioner could pay 10s. a year to a fund, and out of this the doctors (mostly specialists who very often can ill afford either the time or loss of payment which such cases entail) could make a claim and receive if not adequate at least some compensation for their time and services to their colleagues.

Normal Temperature 99° ?

Dr. CSÉPAI writes from Budapest: I have found that in Hungary a temperature of 99° F. or somewhat over in normal individuals, is not a great rarity. In 1930 I took the axillary temperature of 22,000 individuals (panel patients) who previously had been found fit for work. Among the men I found 46 per cent. and among the women 54 per cent. whose temperatures were between 98.6° and 99.4° F. Though some of these individuals might have been actually suffering from one or other diseases, the large number of "subfebrile" cases was striking. Continuing these investigations, I took the temperatures of 1,161 apprentices, all at work without obvious signs of any disease. Among the boys I recorded 29 per cent., and among the girls 43 per cent., "subfebrile." In a secondary school I found among the 13 to 14 year old pupils at 8 a.m. 27 per cent., and at noon 58 per cent., "subfebrile"; among the girls of 17 to 18 at noon 36 per cent. were "subfebrile." I have made many other observations, from which I conclude that one cannot fix the limit for normal temperature at 98.4° to 98.6° F. There are people whose normal temperature is higher and others whose normal temperature is lower. Normal individuals may have a higher temperature even when resting in bed, but more often the temperature rises above these limits under the influence of some excitement or physical exertion. One must bear this in mind particularly when out-patients are examined. Generally this fact is overlooked, though according to the physiologists slight physical exertion can raise the temperature of 0.7° to 0.9° F. Temperatures over 98.4° to 98.6° F. are, of course, in the majority of cases the consequence of pathological, often inflammatory, infectious processes; in other cases they depend on a pathological excitement of the vegetative nervous system. There is no doubt, however, that there are a certain number of people in good health whose temperatures are above 98.6° F., even at complete rest. Perhaps it is not generally known that Wünderlich, the founder of the method of clinical thermometry, gave as the upper limit of normal temperature 99.3° F. Only towards the end of the last and the beginning of this century did the range 98.4° to 98.6° F. become accepted as normal, temperatures above this level being classed as "subfebrile."

First-aid Posts in London

The medical officer of health for the Metropolitan Borough of Poplar wishes to correct an omission in the list of metropolitan boroughs, together with the first-aid posts, which was supplied to us by the Ministry of Health and published in the *Journal* of May 6 (p. 942).

The following first-aid posts in Poplar have been approved by the Ministry: (1) Roman Road Baths; (2) Poplar Baths, East India Dock Road; (3) Island Baths, Glengall Grove; (4) St. Andrew's Hospital, Devons Road; (5) Poplar Hospital for Accidents, East India Dock Road. The provision of two mobile units has also been approved. The first three of the first-aid posts were erected and equipped during the crisis of last September, and would have been functioning if the crisis had developed.

Holiday on the Farm

We have received from the Farmhouse Holiday Bureau, 11-12, Southampton Row, London, W.C.1, their *Holiday Handbook* (7d. post free) for 1939–40. It contains addresses of some 450 houses in all parts of the country, with an index of farms where such things as riding, shooting, fishing, golf, and tennis can be enjoyed. In a foreword Mr. S. P. B. Mais says: "A holiday, especially for children, spent in close communion with horses, dogs, ferrets, poultry, cattle, sheep, and pigs is just about the best holiday in the world. In watching their ways you forget completely the perplexities that encompass the life of man."

Disclaimer

Mr. FRANK ROMER writes: An article referring to me in a certain sporting paper appeared entirely without my knowledge or approval.

Corrigendum

By some inadvertence we stated in our leading article on the statistical history of appendicitis (May 6, p. 928) that that condition is responsible for "nearly two thousand annual deaths." The number of deaths from appendicitis is actually *nearly three thousand annually.*